THE BRITISH JOURNAL

OF

OPHTHALMOLOGY

AUGUST, 1938

COMMUNICATIONS

A CASE OF RHINOSPORIDIOSIS ON THE EYE

BY

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THE presence of Rhinosporidiosis in the human eye is of very rare occurrence especially in the Union of South Africa where only five cases have been reported, including the present case (Simson and Strachan); the parasite has often been reported from parts of India, and an excellent paper was published in 1936 by Allen and Dave in the Indian Medical Gazette.

The first published case of this disease was reported on by Seeber (1900) and the parasite is thus correctly called Rhinosporidium Seeberi; in Berens' Diseases of the Eye the parasite is termed Rhinosporidium Kinealyi, for in 1903 O'Kinealy published the report on a nasal polypus that he had removed from an Indian.

Altogether the parasite has been reported about 156 times as occurring in man where it causes an exfoliative, non-infiltrating granuloma usually situated in the nose, but also occurring in the pharynx, larynx, in the ear and the lacrymal sac, and on the conjunctiva and in the skin.

In South Africa it has been published as occurring in horses (Zschokke) and in mules (Quinlan and de Kock).

The case I am describing was reported on by Simson and Strachan in the South African Journal of Medical Sciences, but in their report of my case the disease had affected only the conjunctiva and its involvement of the limbus of the eye from a recurrence had not yet been recorded.

The patient was a young European boy, aged 16 years, who was sent to me by Dr. Dietrich in February, 1935, for an opinion concerning two large polypi that were protruding from the right eye; it appears that the boy had for several months complained

Photograph by Jane Plotz, Johannesburg.

Rhinosporidial Polypus on Limbus.

of a discharge, tinged with blood, that had come from the right eye; the lad had then noticed that there was something protruding between the right eyelids and that had made him seek medical advice. On examination I found two very large cock's-comb-like excrescences springing from the palpebral conjunctiva and situated in the fornices; the larger polypus was attached to the upper fornix and measured 10 mm. x 6 mm. x 6 mm., whilst the smaller one measuring 7 mm. x 4 mm. x 4 mm. was attached to the lower fornix near the outer canthus; the clinical picture made one suspect tuberculosis but there was no enlargement of the preauricular lymphatic gland.

I removed the polypi by excision at their bases and stitched the

raw areas to control profuse bleeding. I had no idea as to the pathological condition of these polypi and was very surprised to receive the report back from the South African Medical Research that the polypi were of the nature of Rhinosporidiosis. I naturally made enquiries as to the correct future treatment but the literature was rather unconvincing on this particular subject. I ordered ½ per cent. quinine drops and told the boy to report each month. His nasopharynx showed no evidence of polypi.

I lost touch with the boy until October, 1937, when he came to me with the complaint that there was now a red swelling on the white of his right eye. I found that the fornices of this eye were quite clear and showed no sign of the previous operations; on the limbus of the right eye there was however, a raised reddish-looking plaque with several large distended veins coursing towards it; it looked in fact like a severe case of episcleritis. On examination with the slit-lamp I realised that I was seeing a recurrence of the original parasitic infection; the reddish area was a flat type of polypus which was encroaching on and causing a mild secondary infection of the edge of the cornea; the polypus was covered by vascular conjunctiva with several large veins running over its surface; on focusing beneath the conjunctiva I was struck by the presence of numerous yellowish cystic areas giving the general impression of a discoloured strawberry. On careful examination of the cornea I failed to find the typical yellowish specks but there were opacities in the stroma which might have been modified cysts or more likely a reactionary secondary infection.

I excised the polypus with a wide margin of healthy conjunctiva, carefully cauterised the surface of the sclera and also the edge of the cornea and finally covered the whole area with a conjunctival flap. Following the advice of Wright I ordered frequent drops of 2 per cent. antimony tartrate in the infected eye. The convalescence was uneventful, the eye has now whitened and the opacities in the cornea seem to have practically gone; in view of the long interval between the original infection and the recurrence one must wait at least two years before regarding the eye as free from infection; examinations of the conjunctival secretion have so far yielded negative results for the presence of the characteristic sporangia.

In all the cases the polypi present similar macroscopical and histological features:—first the finding of a villous polypus which appears wholly or in part composed of granulation tissue which bleeds readily when touched should arouse suspicion; then on examination with the loupe one sees a fleshy growth covered over by vascular glistening conjunctiva with just beneath the surface the typical characteristics of numerous yellowish-white specks vividly contrasting with the red background.

FIG. 1.

Microphotograph of a cross section of an entire polypus. Very numerous rhinosporidial cysts in epithelial and sub-epithelial tissues. Crypt formation is well demonstrated.

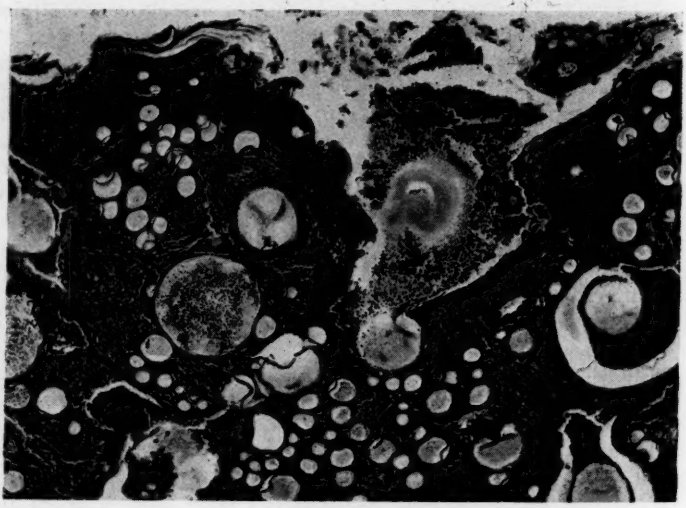

FIG. 2.

Microphotograph of a crypt lined by epithelium and containing a mature sporangium which has burst and discharged its spores into the crypt.

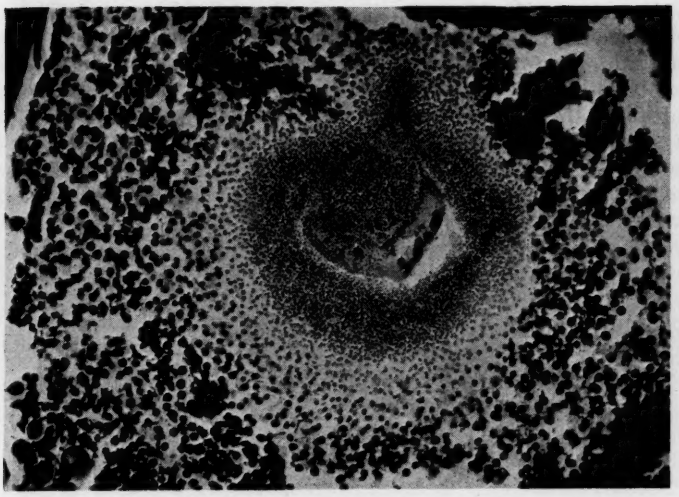

FIG. 3.

High power view of the discharged contents of the burst sporangium seen in Fig. 2.

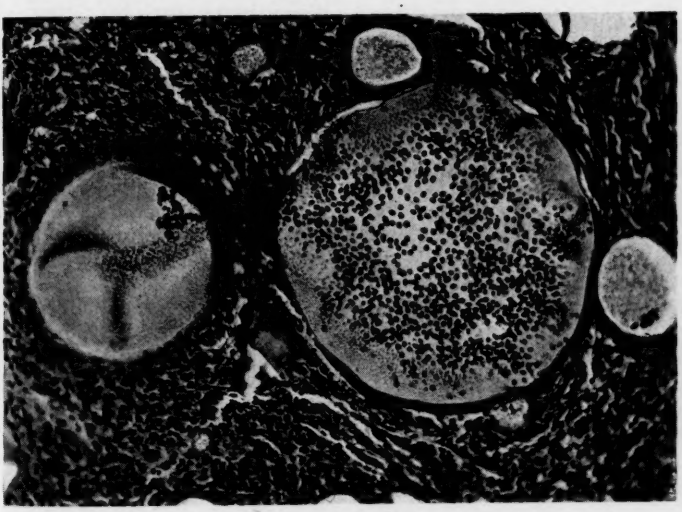

FIG. 4.

Microphotograph showing various stages of the parasite. Accompanying inflammatory changes are well shown.

Microscopically the polypus proper is covered by an irregularly thickened layer of epithelium which is continued into and forms the lining of numerous branching crypt-like spaces extending deeply into the substance of the growth; the stroma in the central portion of the polypus consists of cellular connective tissue which, in some parts is infiltrated by chronic inflammatory cells; the peripheral part of the stroma, especially that lying subjacent to the covering epithelium, is largely replaced by chronic inflammatory granulation tissue and pus cells and some of the crypt-like spaces contain pus. The predominant inflammatory cell is the plasma cell. In the sections reproduced one can see numerous cysts lying chiefly in the subepithelial tissues. The mature sporangia tend to find their way through the epithelial layer and numbers are seen lying free in the crypts and frequently the sporangia are seen in the act of discharging spores.

The bacteriological diagnosis is comparatively easy; the growth is gently squeezed with the forceps, the contaminated blades are teased in a drop of saline and with the low power of the microscope the sporangia are easily seen; the alternative method is to make a smear and stain this with Romanowsky's stain or better still Heidenhain's iron haematoxylin stain and the spores are seen containing the characteristic ten to sixteen refringent spherules.

The parasite is a vegetable one belonging to the order Phycomcetes such as the Chytridineae and placed in the suborder near Olpidiaceae.

There is no evidence to show that a spore, having passed out beyond the epithelial covering of a polypus can re-enter the subepithelial tissues through an unbroken surface; reinfection appears to occur by way of lymphatic currents normally present below the epidermis.

The mode of infection is very difficult to explain. My patient has had no pet animals in his house nor has he handled horses or mules; there has been no history of trauma or of any history of bathing in infected pools. The other members of his family are all quite free from infection and the parents are at a loss to account for its origin. I doubt whether trauma could be the main cause, for the recurrent limbal growth was far removed from the original area of excision of the primary polypi. It may be, however, that a few sporangia had remained dormant in the conjunctival sac for the very long time of 18 months and then had gained admission through a fresh area perhaps by rubbing the eye.

In operating upon these polypi one should always wear gloves as the spores are quite likely to gain admission into an abraded

surface or be carried to the eye or nose by the contaminated fingers. All instruments after operating should be treated with strong lysol in order to dissolve the chitinous envelope of any spores that might have remained on the points.

Electrotherapeutics may come to play a large part in the treatment of this disease, for in the more inaccessible regions the electrolysis needle might be of advantage; should my patient show further corneal involvement I shall have to consider the use of radiant energy perhaps in the form of radon seeds.

One must never use the snare for the removal of the polypi as reinfection is likely to take place from the irregular crushing that this instrument causes.

Allen and Dave have had some measure of success by treating their cases with neostibosan (Bayer) which is given in the adult dosage of 0·3 grammes intravenously daily for 10 days until 2·4 grammes have been administered, but they mention that there is still the need for a more convincing drug, that the criterion of cure can only be established after three or four years, and that natural cure may also sometimes take place.

Dr. Simson has suggested that the violent dust storms that are so prevalent in the Transvaal might be the means by which the spores are lodged in the human eye. These dust storms cause an enormous amount of eye suffering in this country in that they seem to be the cause of the very frequent large fleshy pterygia which one so often sees.

I am indebted to Dr. Simson and Dr. Strachan for permission to reproduce the photographs of my sections.

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ABLATIO FALCIFORMIS CONGENITA (RETINAL FOLD)

BY

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IN the *Arch. f. Augenheilk.*, Bd. 109, of 1935, a description was given of a series of cases of congenital retinal folds and attention was drawn to their close relation to cases of pseudo-glioma, caused by congenital retinal detachment. Therefore the name of " ablatio falciformis congenita " was chosen. Furthermore, it was shown that this congenital abnormality is in most cases familial and probably hereditary.

I pointed out that the congenital retinal folds as described can perhaps be imitated to a certain degree by inflammatory processes in childhood, but that on the other hand a number of peculiarities make it quite clear that this is not the case in our true cases of congenital folds.

At exactly the same time Ida Mann published in the *Brit. Jl. of Ophthal.*, December, 1935, a very interesting paper dealing with a series of similar cases which this author could study anatomically. She found that in all the cases which have been examined microscopically, the whole of the retina (not only that in the fold) shows imperfect differentiation and this should put out of count any suggestion that the condition is at first a traumatic detachment or a localised inflammation. " We are dealing with a disturbance of growth of the whole of the inner layer of the optic cup at an early age."

Since my last communication I have had the opportunity of observing some more cases which sustain, like my former clinical and anatomical observations, this opinion. (See discussion, Nederlandsch Oogheelkundig Gezelschap, May 24, 1936, and Demonstration of the same Society, January 30, 1938.)

This will be abundantly clear from the following facts:—(*a*) The typical form of congenital retinal fold is very often bilateral. If I include the cases of congenital total retinal detachment (" pseudo-glioma ") I find in 12 cases observed by myself 6 cases bilateral. From the 6 cases described by Ida Mann 3 are bilateral (in the other 3 cases nothing is said about the second eye). Further, the retinal fold was bilateral in the cases of Holm and in one of the cases of van Manen (not yet published), unilateral in the case of Salfner, in one of the cases of van Manen and in the case of de Vries-Ancona, although in the latter posterior polar cataract of the second eye was observed.

Altogether in at least 11 of the 22 cases it was bilateral, that is, in 50 per cent.

(*b*) In all the bilateral cases observed the fold is symmetrical. This fact points very strongly to an abnormal development and against inflammatory origin.

(*c*) The abnormality is often familial. To this fact I first called attention in my above-mentioned paper. Since I paid special attention to this, I found it so frequently that the supposition is permitted that the same would hold for many of the other cases that were not studied from this point of view. (In this connection I might recall the frequency of arachnodactyly as a familial and hereditary disease. Before I drew attention to this it was not noticed although some cases were already described. Since then the number of familial cases has so increased that it almost seems the rule.)

Here are my own observations on the subject as described in previous communications:—

Family A.—Cases 1 and 2 are brothers. Case 3 is a child of the marriage of the son of the brother of the mother of cases 1 and 2 with the daughter of a sister of the same, *i.e.*, first cousins.

Family B.—Cases 4 and 5 are sisters but, as it is doubtful whether case 5 belongs to this group of abnormal development, I prefer to leave case 5 out of consideration.

Family C.—Cases 6 and 7 are uniovular twins with symmetrical folds in all four eyes! This observation alone should prove sufficiently the non-inflammatory nature of the abnormality.

Family D.—Case 8 refers to a patient whose eye was enucleated nearly 20 years ago by the late Prof. Snellen. I had no opportunity of getting further information about the family.

Family E.—Cases 9 and 10 (to be described in this paper) are brother and sister. The parents are cousins. Case 11.—Another brother showed a *forme fruste* (examined at my request by Miss Ancona) but refused to come to the clinic for further examination.

Family F (to be described in this paper).—Case 12 has a grandmother who shows a *forme fruste*.

This shows that familial occurrence was manifest in at least four of the five families I could study personally. In this connection I will also mention that in at least seven of my cases there is consanguinity of the parents.

(*d*) I must once more draw attention to the fact that the retinal fold shows in the great majority of the cases a prevalence for the temporo-inferior sector of the eye. If we include the horizontal and vertical meridian, this was the case in all the eyes seen by myself with the exception of only one case to be described in this paper. It was also so in the case of de Vries later anatomically described by Miss Ancona, in the case of Holm, in five of the

eight eyes described by Miss Mann and in the case described by Tillema. In the second volume of Sir W. Stewart Duke-Elder's Text-Book of Ophthalmology I find in Fig. 1266 another beautiful example closely resembling most of my cases. On the contrary I know only very few cases with a fold in other meridians and these cases show other peculiarities that might perhaps justify their classification in a special category (see afterwards). (Both eyes of case 2 of Mann and her case 3, furthermore one of the cases of van Manen and one of my own observations.)

Although we are not yet able to give a satisfactory anatomical or embryological explanation of the above-mentioned fact, it seems in accordance with a congenital abnormality of development and in contradiction to an inflammatory explanation.

(*e*) Another fact that points strongly in the direction of a developmental abnormality is the frequent association with other typical developmental abnormalities of non-inflammatory origin. In many cases a persistent hyaloid artery is found, and also persistent pupillary membrane is frequent. Microphthalmos in a slight degree and circumscript congenital cataract occur. Furthermore, nystagmus seems to be constant in bilateral cases and frequent in unilateral.

(*f*) Until now the condition has only been observed as a congenital one or in early childhood. It seems unlikely that the eye of the adult should never be able to respond in a similar way to an inflammation with cyclitic membrane, and as long as such cases cannot be proved to exist inflammatory origin of cases in early childhood is at least suspect.

Fig. 1 shows the condition found in an eye kindly lent me by Professor Emil de Grosz from Budapest. In this traumatic case something resembling the described abnormality is found but anatomical study shows that it is a simple case of cicatricial local detachment, caused by holes at the ora serrata and without abnormality of the retinal vessels (which cannot be seen in the picture). Short history of the case:—

Praep. Nr. 5872.—At the age of six perforation with a knife. Cicatrix adhaerens corneae et sclerae. Cataracta traumatica complicata. Atrophia bulbi. Hypotonia.

That inflammatory cases resembling strongly the ablatio falcif. cong. may exist nevertheless is made probable by the description of a case given in my first paper.

Tillema in his paper erroneously refers to this observation as to my " case 8." I did not give this case a number as in my opinion it did not belong to the " congenital " class.

(Tillema's conclusion that this case and his own prove an inflammatory origin and " Wev's original idea to be correct " needs further correction as I never advocated an inflammatory origin of the " Ablatio falciformis congenita " but only mentioned it while I discussed the different theoretical possibilities).

Here I might also state that possibly even in this case (Nr. 2356) that was not observed by me personally but many years ago by a provincial physician, the inflammation may have been secondary to a congenital abnormality. This, as Waardenburg pointed out in the discussion in the Dutch Ophthalmological Society (May, 1936), where Tillema read his paper, is by no means rare

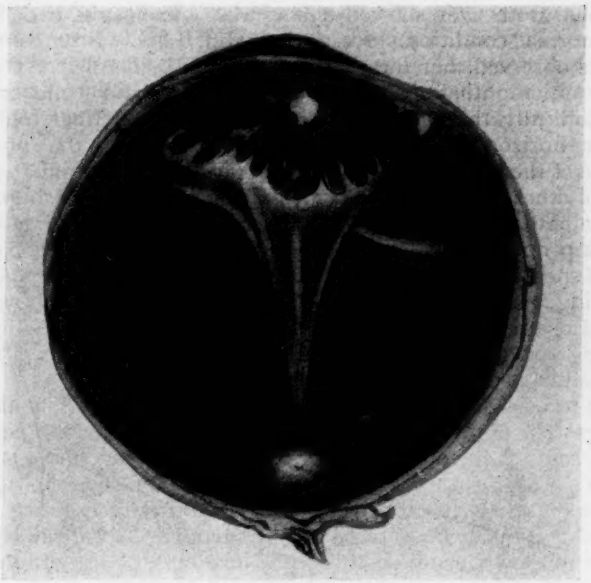

FIG. 1.

Pseudo ablatio falciformis of traumatic origin. (Praep. 5872.)

and could have happened, especially in Tillema's case. See also Carl Heyl, pages 16 and 17.

(*g*) As Miss Mann pointed out the whole of the retina shows, in the cases studied by her, imperfect differentiation, which should put out of court any suggestion that the condition is at first a traumatic detachment or a localised inflammation.

(*h*) The occurrence of the condition in the same family alternating with typical " pseudo-glioma " of the complete retinal detachment type strongly suggests the aetiological identity of both conditions.

As Carl Heyl points out in his recent book, " Ueber Retiniten unbekannten Ursprungs, 1937," we must abandon Leber's

opinion about the inflammatory origin of this form of " pseudo-glioma." In his opinion the great majority of the so-called pseudo-gliomata are congenital abnormalities.

Rintelen (Graefe's *Archiv.*, 135, 1936) came to the same conclusion. The anatomical examination of the eye to be described in this communication also supports this opinion.

Here follows the description of a new case of congenital fold:

P.O., the patient, came in January, 1936, to our clinic from Vianen. Both eyes showed nystagmus. The right eye showed no abnormal condition. Refraction Hm. 1·0D. From birth the parents observed that the eyesight was bad. The left eye shows slight microphthalmos with typical " ablatio falciformis." Skiascopically there was 3·0D. myopia. The retinal fold runs almost horizontally and is inserted partly on the posterior surface of the lens (Fig. 2). The fundus shows the typical appearance of other cases with depigmentation and abnormal pigmentation at both sides of the fold. With the ophthalmoscope or the slit-lamp no persistent hyaloid artery can be found. Some very white spots (calcareous deposits?) on the peripheral parts of the ridge drew our attention. The optic disc shows the typical characteristics observed in nearly all of my cases, notably the ring of pigment. The vessels are extremely fine. It is almost impossible to distinguish arteries from veins.

The father and mother are cousins, German. The patient is the youngest of eight children. The eldest daughter, now aged 19 years, came at the age of six years to the Utrecht University Eye Clinic. The right eye was then extirpated for suspected glioma (see below). Of the other children I could only examine the 13 year old Hans, who showed slight myopia. Miss Ancona was kind enough to examine the other members of the family; she found three of them slightly myopic and further, only abnormalities in the left eye of the 16 year old Bob. Here the optic disc and the vessels emerging from it showed unmistakable signs of the abnormal condition in a slight degree. As the boy flatly refused a further examination, unfortunately I cannot give a picture or other details.

I was therefore the more interested in the study of the eye of the eldest girl, enucleated in 1923. At that time the anatomical examination was done in the laboratory of the pathological institute and only three slides were presented to our collection, all going through the optic nerve. Unfortunately the rest of the eye could not be recovered, but the slides of our collection allow, nevertheless, the diagnosis: pseudo-glioma of the congenital total detachment type.

I think it worth while to give a description of this case:

A.O. entered our clinic in 1923, aged six years. The parents

assured us that the right eye was abnormal from birth, whilst the left eye seemed normal. The left eye was emmetropic and the vision was normal, although it was noticed that the retinal vessels were broad and made marked curves at the border of the optic disc and the papilla was not prominent. The right eye was completely blind. The pupil was displaced in a nasal and superior direction. At the lower pupillary margin strong synechiae post. were observed. The anatomical examination showed that the eccentricity of the pupil was combined with ectropion uveae and that both were caused by a mesoblastic tissue on the surface of the iris which also caused anterior synechiae in the upper periphery of the iris (obliteration of the angle of the anterior chamber). (Fig. 6.) No signs of recent inflammation or of glaucoma were

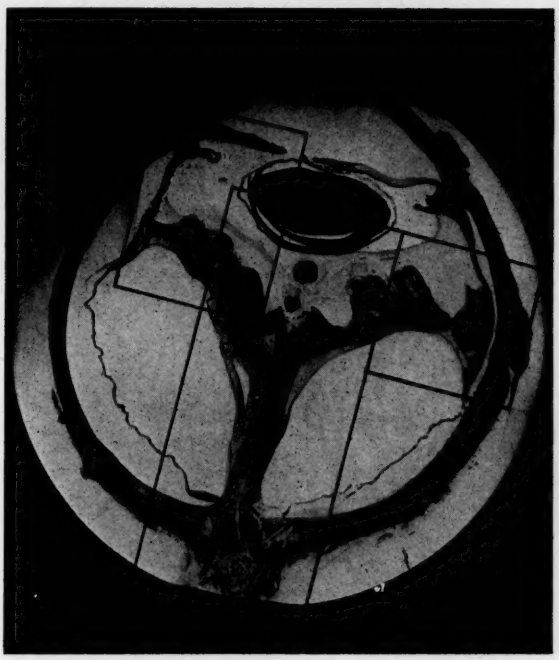

FIG. 3.

Photograph of section through the eye of Alida O. with congenital total detachment with indication of the parts reproduced in the pictures 4, 5, 6. (The central part Fig. 4 is taken from a section very near to this one.)

FIG. 4.

Central part of section through the right eye of the 6 years old Alida O. with pseudo-glioma (c = cysts). See Fig. 3.

observed. Behind the lens a white cauliflower-like mass was observed with glimmering crystals. Through and between this mass here and there bloodvessels were visible. As this suggested a glioma the eye was enucleated. It was slightly microphthalmic. Dimensions in anatomical slides 19 mm. long and 18½ mm. broad.

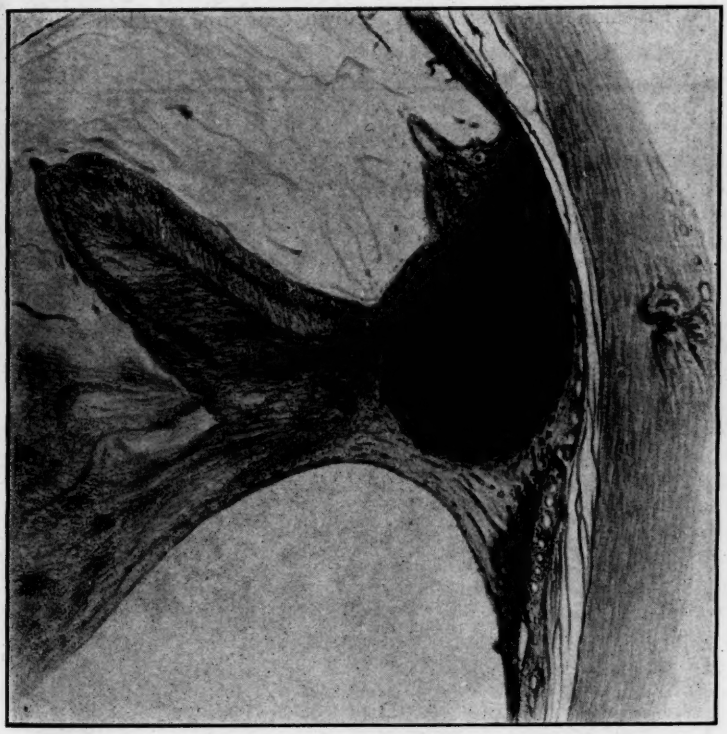

FIG. 5.

Temporal anterior part with fixation of the retina with nucleus of pigmented cells. See Fig. 3.

Typical aspect of pseudo-glioma caused by congenital detachment. A ring of bone in the choroid around the optic nerve shows that the condition is an old one. The ciliary body shows no sign of so-called cyclitic membrane. This organ is imperfectly developed but shows otherwise nothing pathological. The retina is completely detached and appears stretched between its points of

attachment, *i.e.*, the entrance of the optic nerve and a zone well behind the ciliary body, thus forming a flower-shaped calyx. In the circular zone of attachment extremely marked pigmentation is found. (Fig. 5.) At one side this pigmentation is in the form of fan-shaped stripes or septa (Fig. 6), at the opposite side there exists, furthermore, a roundish mass of pigmented cells with a nucleus containing calcareous deposits. (Fig. 5.) By applying the Prussian blue test it was shown that this pigment did not

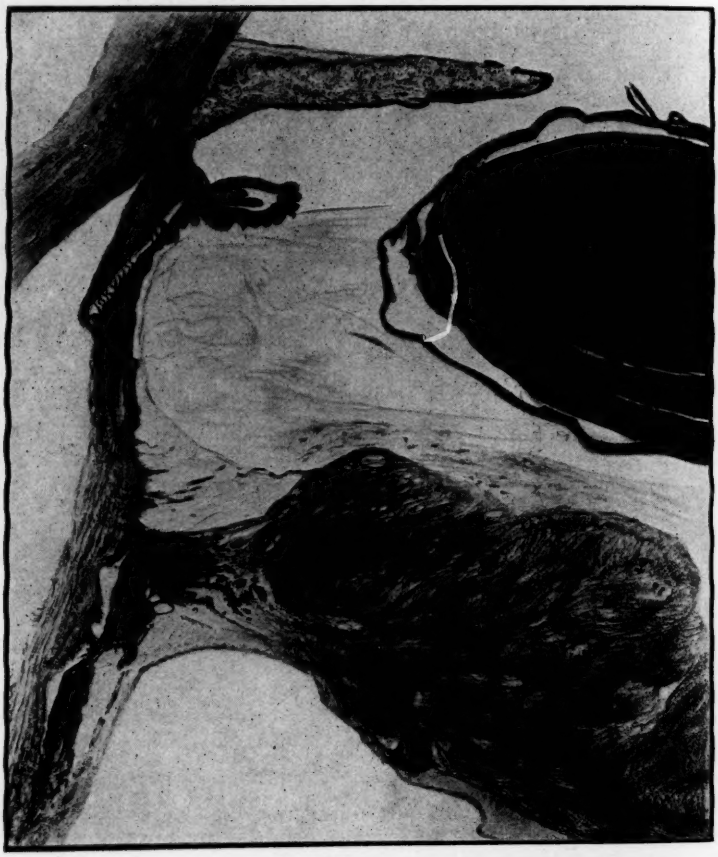

FIG. 6.

Nasal anterior part. See Fig. 3.

contain iron and therefore was not of haemorrhagic origin. It seems that the optic nerve fibres with their vessels reach into the centre of the irregular septum formed by the remnants of the retina, whilst the stem of the calyx seems to be enclosed in enormous retinal cysts that are flattened against the nerve by traction. (Fig. 4.) In the pars plana of the ciliary body (or perhaps the retinal part of the ora serrata) cystoid degeneration (Iwanoff type) is found at one side. The vitreous shows no organisation but very clearly, " rests " of persistent embryonic vessels. The epithelium of the lens extends at both sides very far on to the posterior surface. Parts of the posterior cortex are cataractous, and here also cells (epithelium?) are found.

Nowhere are there signs of inflammation. The whole aspect is typical of a congenital detachment and resembles strongly the anatomical aspect of true cases of ablatio falciformis, showing thus once more the relation between both conditions that was already made sufficiently evident by the alternative occurrence of both conditions in the same families.

It may be pointed out that posterior synechiae, ectropion uveae and congenital obliteration of the angle of the anterior chamber are well-known signs of congenital developmental abnormalities and do not prove therefore an inflammatory origin.

The retina itself shows marked abnormality. Only here and there something resembling the normal retinal structure can be found. It would even be too much to say that the retinal layers are imperfectly differentiated. There exists in most parts a complete metaplasia with marked preponderance of the glial tissue. No rosette formation is visible. The figures show this condition better than a long description. I wish to point out specially that the optic nerve seems to be drawn well into the interior of the eye in exactly the same way as in cases of " retinal fold."

In the slides we could examine, nothing was found resembling abnormal tissue covering the retina and projecting in the direction of the optic nerve as described by Leber, who was of opinion that this proved an inflammatory origin resembling strongly the cases of detachment caused by mild forms of metastatic ophthalmia. (If this should be pathognomonic of an inflammatory origin, which nowadays is no longer accepted, then the complete absence of this tissue in our case should suggest here another origin.)

The choroid is extremely thin and shows only around the entrance of the optic nerve thickening with enclosure of bone. The pigment epithelium of the choroid is only partly visible, the parts of the choroid next to the optic nerve, especially the part where bone formation is visible, are totally devoid of pigment epithelium,

whilst the development is very sparse and irregular in the equatorial parts. The strong development of pigment in the parts where the retina adheres to the choroid seems to be of retinal origin. (See the Fig.) In the ciliary part of the retina the pigment layer is well developed. The same is found in the iris.

The facts and arguments given above may be sufficient to prove the nature of the so-called ablatio falciformis congenita as a developmental abnormality. But as our knowledge is still imperfect, I think it advisable to describe every case that comes to our notice.

The following case shows many peculiarities that in itself justify a detailed description, the most interesting fact being that this case seems to be linked up with a somewhat atypical form of familial retinitis pigmentosa. Be it in an indirect way this once more suggests a developmental abnormality of familial and hereditary type.

Joh. H. L., aged ten years, from Eindhoven, visited our clinic in November, 1936. Since birth he showed rotatory nystagmus and the left eye was always blind. Signs of inflammation were never observed. The right eye has slightly sub-normal vision

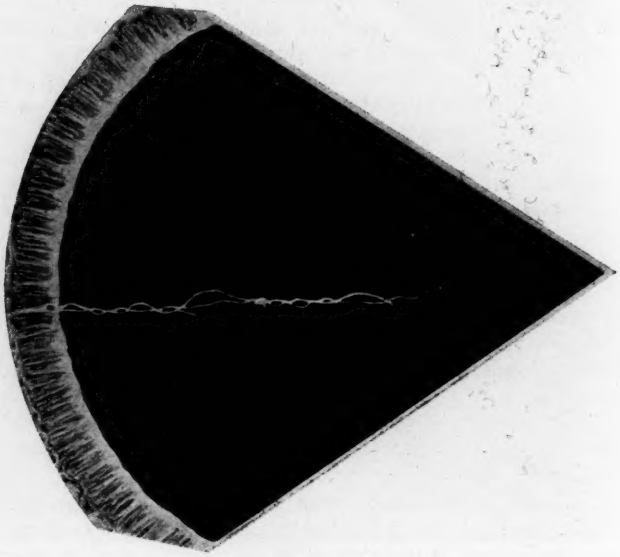

FIG. 9a.

Membrana pupillaris persistens. J. L.

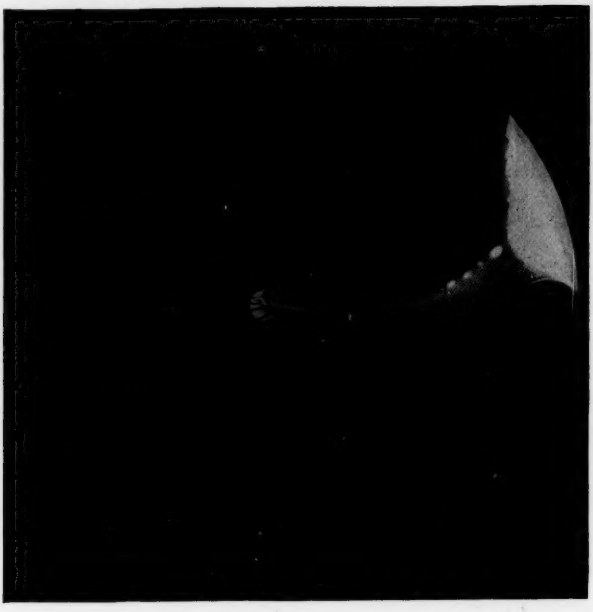

FIG. 2.

Typical retinal fold. Right eye of P.O., whose eldest sister showed complete congenital detachment.

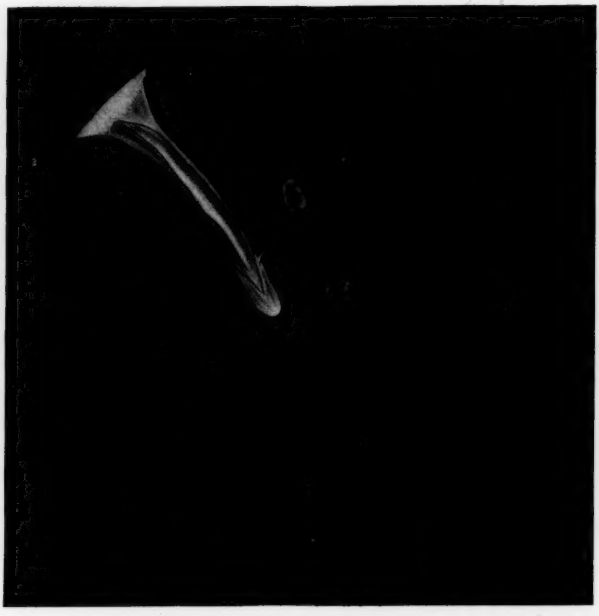

FIG. 7.

A typical retinal fold of the left eye of the 10 years old J. L.

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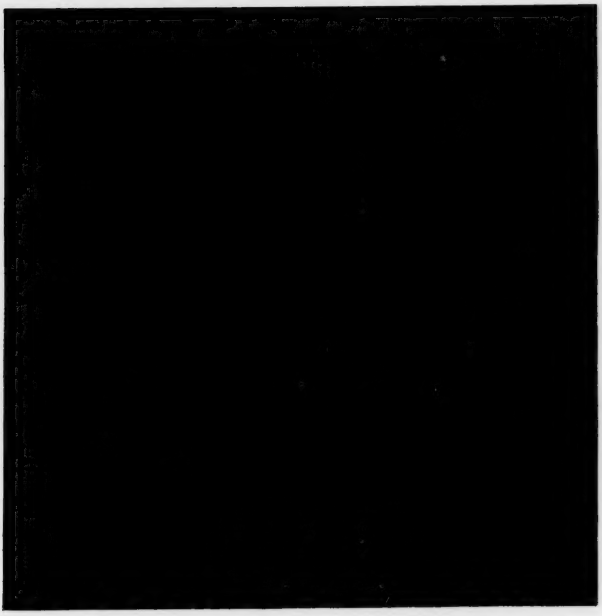

FIG. 8.

Pigment-free fundus of the right eye of the 10 years old J. L.

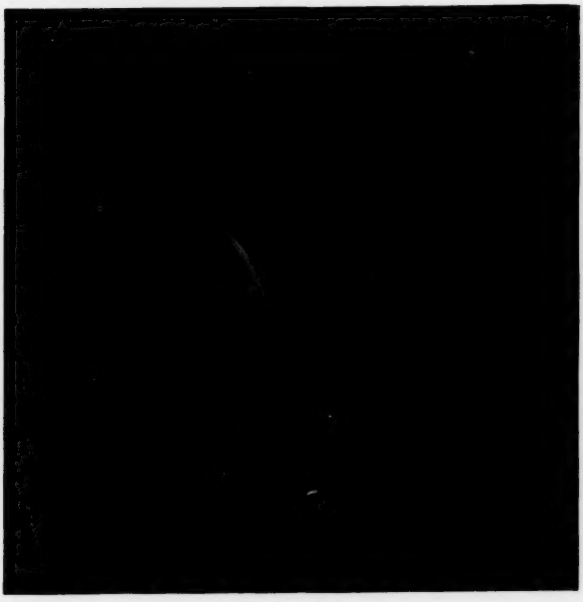

FIG. 10.

Fundus of the 70 years old grandmother L. B. with atrophia retinae pigmentosa and forme fruste of retinal fold.

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(5/6). It is emmetropic. The fundus is nearly completely devoid of pigment, all the choroidal vessels being distinctly visible. The retinal vessels are extremely thin. Arteries and veins cannot be clearly distinguished. (Fig. 8.)

The left eye shows the following series of abnormalities:

1. Membrana pup. persistens. (Fig. 9a.)

FIG. 9b.

Deposit at the posterior surface of the lens from which a feather-shaped cataract emerges. J. L.

2. A deposit of (connective ?) tissue at the posterior surface of the lens in its nasal upper periphery. From this a feather-shaped cataract emerges on the posterior surface of the lens pointing to the centre of the pupil. (Fig. 9b.)

3. Abnormal pigmentation in the pigment layer of the retina, partly in the form of dots of about the diameter of the optic disc, partly in the form of bows of pigmentation, partly in the form of finest pigmentations scattered between the bigger ones. Through and between all this pigmentation the choroidal vessels are very distinctly visible.

4. In the para-foveal parts and medially above the centre,

yellowish white areas of depigmentation are visible, strongly resembling retinal colobomata or choroidal cicatrices.

5. A typical " retinal fold " running from the entrance of the optic nerve to the nasal superior periphery, where it is attached to the lens in the region of the tissue covering the posterior surface of the lens. (Fig. 7.)

On the surface of the fold three retinal vessels are to be seen emerging from it at some distance from the entrance of the optic nerve. At about 4 mm. from the entrance of the optic nerve a single retinal vessel comes from under the fold running at some little distance nearly parallel to it. In its central parts this vessel is at one side bordered by a white line. This is the only visible vessel of the whole retina!

It is therefore understandable that a former observer overlooking this vessel wrote: " the retina is entirely rolled up into a single skein that is attached to the lens," and another observer made the diagnosis: " cicatricial chorioretinitis disseminata." Those who know the clinical aspect of congenital " retinal fold " will, however, not hesitate to enlist the case in this category. I therefore was very much interested in the family history. Dr. Ancona was kind enough to examine the parents, a sister and the six brothers. There is no consanguinity of the parents. The mother showed in the left eye changes described as " cicatricial chorioretinitis." Of the brothers and sisters from the ages of two to fifteen years no one showed fundus changes. Among the elder children slight myopia and myopic astigmatism was frequent. In one case unilateral myopia of 4·0D. was observed.

This examination therefore was not very helpful, but our attention was drawn to the fact that the grandmother on the father's side and the brother of this grandmother were attended to in former years in our clinic. I was able to re-examine them with the following results:

The 70-years-old Mrs. L.B. was described in 1930 as a case of retinitis pigmentosa with complicated cataract. In 1931 lens extraction was performed on the left eye. It was then noticed that the pigmentation did not show the typical stellate shape but formed a broad ring of roundish dots, whilst the central parts of the retina were dusted by fine pigmentation. The blood vessels were fine. The field of vision was after operation about 20 to 30 degrees. The central vision was nearly $\frac{1}{2}$ after correction with a glass (+10·0D.sph.). The right eye was entirely amaurotic and had a cataracta subluxata. Ophthalmoscopic examination was impossible. At our examination the pigmentation corresponded quite well to the description given five years before, but on close examination something like a thin fold of the retina was also observed in the same axis as in the eye of the grandchild. (Fig. 10.)

In order to have an unprejudiced opinion I asked our artist to sketch the fundus without drawing his attention to this fold-like appearance. The Figure (10) shows the result. In order to distinguish this somewhat uncommon retinitis pigmentosa from inflammatory alterations I also examined the brother of the grandmother.

W.A.B. (aged 58 years) showed in both eyes the picture reproduced here for the left eye. (Fig. 11.) The picture strongly

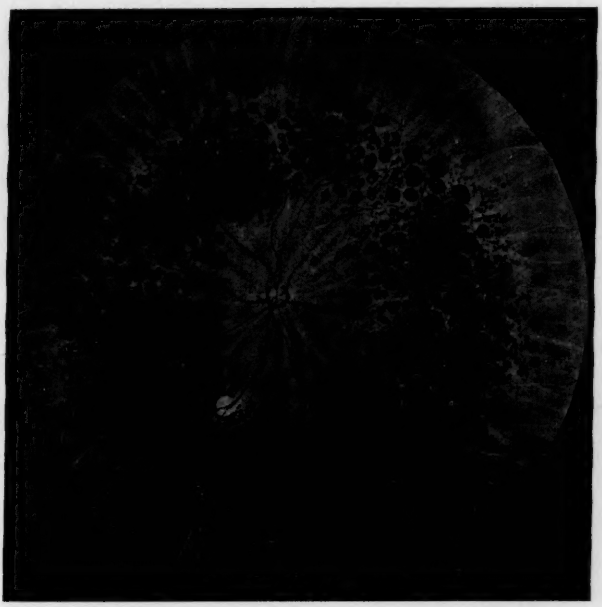

FIG. 11.

Fundus of the 58 years old brother of the grandmother W. B.

resembles that of his sister. The blood vessels are very fine, and beyond the zone of pigmentation are, without exception, changed into fine white lines. In the nasal inferior part just at the beginning of the zone of pigmentation a yellow patch resembling a cicatrix of chorioretinitis is visible. Both eyes show cataracta cort. post. Night blindness existed from early youth. The fields of vision are only 3 to 5 degrees, nevertheless the vision is 1/10 in the right eye and 1/6 in the left. Further information about the family was not available.

It is to be regretted that at the moment of the examination of the ten-year-old child we did not examine the dark adaptation. The parents refused afterwards to re-visit the clinic for this purpose.

In discussing this case and especially the fundus alterations suggesting scars of chorioretinitis I might draw attention to similar cases described elsewhere, particularly to the case of Magnus (Graefe's *Archiv.*, 118, 1920) who studied a case of bilateral pseudo-glioma caused by fibrous tissue behind the lens with arteria hyaloidea persistens and microphthalmos. The second eye could be partly examined ophthalmoscopically and the aspect is described as follows: discoloured and depigmentated areas are visible that remind one of choroiditis and are localised in the layer of the pigment epithelium. Nowhere retinal vessels were visible, although no detachment existed in this part!

This case shows that the fundus appearance found in our case does not necessarily prove an inflammatory process.

FURTHER LITERATURE

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SOME CLINICAL NOTES ON THE NATURE OF THE RETINAL VENOUS PULSE

BY

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Description

THE same method was used as in the investigation of retinal vascular disease—a 12 volt red-free light worked with a current of 20 volts or more. This is essential as the brilliancy of the over-heated wire increases the red-free part of the spectrum and the more overcharged the lamp the better it is for the resulting illumination. The patient would generally experience great discomfort if this intense light were to fall unguarded on to the retina, but if the red-free filter is placed in such a position that all the light emanating from the bulb is coloured, it will mitigate this inconvenience.

Commencing from the periphery, in the primary branches of the veins and, in favourable cases, in even the secondary branches, especially the thicker ones, the venous pulse was discovered in all patients except where an obstruction in the optic nerve or further beyond it produced an engorgement of the veins. It is much

more noticeable in children and in the young *ceteris paribus*, but is not much affected by age or disease. It becomes more pronounced nearer the disc and on the disc itself it presents two varieties. One is the same as on the periphery and may be called the ordinary basic pulse. The second is the well-known type of piston-like movement that we will call the spontaneous venous pulse. Both are of locomotor character, *i.e.*, no displacement of the venous trunk is caused by them. On the periphery one can discern the venous pulse by carefully watching the vein, or by noticing the light reflexes already described, as produced by the column of blood inside the vessel. If a comparison be permissible it resembles the respiratory movement of the abdomen of a small lizard when motionless. In all patients the number of widenings and narrowings of a vessel on the periphery (both counted as one) corresponds in number to the pulsations of the temporal artery, but they are slightly slower. This regularity is still preserved on the disc in the majority of cases, but in some patients a kind of back-flow of blood suddenly appears and the movements of the venous walls are not as smooth as before. If one can trace the venous pulse deeply on the disc in many cases one can see both veins pulsating in a kind of spontaneous venous pulse, but not in such a clear piston-like manner as the original second type.

If a vein, even a sharply pulsating one, is crossed on the disc by an artery, the latter may be a very thin one, the venous pulse is usually but not always, stopped or at least considerably diminished, at the point of crossing. A sister vein, but not a crossed one, will show a spontaneous pulsation for a longer distance because it is not impeded by the crossing artery. It may be argued and quite correctly, that this sister vein may simply dip in the central vein at a sharper angle, but this would hardly apply in all cases. The basic venous pulses, on the contrary, are seldom impeded or influenced by an arterial crossing, even in a highly sclerotic eye, unless the vein is definitely crushed, has white stripes at the point of crossing and subsequent banking and deflection. If a vein crosses an artery, even if the vein is flattened and the blood stream becomes so thin that the artery can be seen through the super-imposed vessel, the spontaneous venous pulse, if present, is more distinct and brisk. This, however, only occurs when the vein bends over the artery and then sharply dips into the disc, the artery serving only as an additional factor to impress the sharpness of the bend on the vein. If, on the other hand, the vein crosses the artery somewhere near the periphery of the disc and then dips sharply into the disc, the spontaneous pulse will only appear at the latter point, the former being powerless to produce it as the vein is not bent sharply, but

if the vein is bent sharply over the artery then the pulse is distinctly of the spontaneous type especially if the angle of the bend is very sharp. At this point it is important to note that the observer sees the crossing from the obtuse side of the angle but striking at the top of the apex in the sagittal direction. It may also be observed when the vein bends sharply over the edge of the disc, but I did not see a spontaneous venous pulse in cases with glaucomatous excavations. One must bear in mind that all the above remarks are only more or less accurate, as the combination of veins and arteries on the disc and their designs are protean and numerous.

The second type.—The piston-like movement of the spontaneous venous pulse is a beautiful phenomenon; if once detected it is constantly present in the same vessels, the number of pulsations being identical with the beat of the temporal artery, but slightly posterior in time. It is regular and does not noticeably change in character as sometimes happens in the first variety. Briskly spontaneous on the disc, especially before the artery dips into the disc, it is of the first type on the periphery. It is especially noticeable if the artery disappears into the disc at an angle of 90° or less. The sharper the angle formed with the disc the better. Although the character of the spontaneous pulse is constant for a definite vein its intensity may be different for veins of the same size and direction in different subjects. One or more veins in the same eye may show the spontaneous pulse and the rest the ordinary one. Otherwise, all veins show the spontaneous pulse, or else the ordinary one. It is interesting sometimes to watch a few major trunks flow majestically and contract with dignity on the disc, whilst a small one, usually independent, is very busy with spontaneous pulsation. Each eye in the same patient has its own combination. By applying digital pressure or using Bailliart's ingenious dynamometer, it is well-known that one can produce some changes in the pictures. Some or all the veins will change their ordinary venous pulse into a spontaneous one, the originally spontaneous pulsating vein only intensifying its action and blanching at the end of every pulsation, but never changing from the second to the first type. A few or all the veins of the first type will collapse altogether, but will never change to the second one, and the spontaneous vein will collapse also, but will not change to the first type. For the purpose of this paper it was more important to note the percentage of eyes with a spontaneous venous pulse and then to distinguish between those where only a few or all the veins were thus acting. This, together with the difference in technique, is the probable explanation of the fact that my figures may not be identical with those of such authorities, to mention only two from among a very large number, as R. H. Elliot and Bailliart.

According to Elliot, the spontaneous venous pulse was seen in both eyes in 46 per cent., absent in 40 per cent. and present in one eye only in 14 per cent. Of the group of 46 per cent., the pulse was even in both eyes in 28 per cent. and uneven in 18 per cent. Of the 40 per cent. where the spontaneous pulse was absent, in 12 per cent. it could be elicited in both eyes by pressing and in 18 per cent. in one eye only. In 200 eyes the spontaneous pulse was present in 49 per cent. and absent in 51 per cent. To quote Elliot's words, " one can never detect the venous pulse beyond the papillary limit." This may be accounted for in three ways. (*a*) The vessels and their movements show up, on the optic disc. (*b*) On the retina they are imbedded in its structure, whilst on the disc they lie comparatively free (Bailliart). (*c*) The pulse has probably spent itself within the limits of the disc. It is usually accepted that every feature of these changes is transmitted from the auricles right along the columns of venous blood behind them.

Bailliart thinks that the spontaneous venous pulse exists when the venous pressure is slightly above or even equal to the intra-ocular tension. When the latter is much above the former the venous pulse can be produced by pressure on the globe. If the latter is inferior to the former massage of the globe will produce a venous pulse. The venous pulse is produced by the systolic wave of blood and aspiration by the diastole and systole of the auricle. Immediately after death both varieties of the venous pulse disappear. They usually cease quite suddenly and digital pressure only empties the veins. Once when I performed a venesection and whilst the patient was lying on the couch, immediately after death, as elicited by cessation of breathing, usual pupillary signs and abrupt cessation of the flow of blood from the cut vein, I saw for some moments very irregular beatings of the vein deep in the substance of the disc, similar to the flickering flame of a candle before it dies out.

Pressure in the retinal vessels.—Unlike the arterial and arterio-capillary system where the pressure is maintained by the—*sit venia verbo*—brute force of the systolic wave and consequent constriction of the distended peripheral vessels, the venous pressure is more elaborately organised. It depends first of all upon the transmission of the impetus—*vis a tergo*—from the arterial capillaries to the venous ones. The venous walls, although able to contract, and even to be controlled by a special centre in the brain, are not an essential item in the maintenance of the venous pressure and various factors are of importance in different parts of the body, such as, the respiratory movements of the chest, contractions of voluntary and involuntary muscles,

diastole of the heart, etc. But if the science of the venous circulation is the Cinderella of modern clinical medicine it is a very precious item in the eyes of nature and no efforts are spared in maintaining it constantly and in any case, not below a certain level. Leaving aside the venous sinuses of the auricle of the heart, we find that in the eye, kidney, liver, spleen and perhaps the brain, a more or less elastic, but sometimes hardly distensible membrane is provided outside the organ to keep its structure maintained and at the same time to preserve the venous circulation.

Gauss saw the venous pulse in 91 cases out of 150. It was not seen in 10 cases and could not be detected in the rest. Kurzes Handbuch der Ophthalmologie quotes only the authority of Bailliart and his figures. No spontaneous pulsation of the veins in 42 per cent., an intermittent one in 21 per cent. and a spontaneous venous pulse in 37 per cent.

Statistics

In Eyster's scheme the arterial pressure in man is 120 mm., in arterioles 80 mm., in capillaries 20 mm., in the venules 10-15 mm. and in the veins from plus 8 mm. to minus 1·2 mm. In Binton-Opitz's experiments we find the same principle. The pressure in the saphenous vein is higher than that in the femoral; in the facial more than in the jugular. The figures for the abdominal cavity require special consideration. The highest pressure is in the mesenteric veins, probably because it is helped by the continuous peristaltic movements of the intestines. The same applies to the vena gastro-lienalis and lienalis. It cannot, however, be applied to the renal vein. It is probably the capsule which keeps the vascular pressure within the kidneys at a certain level, analogous to the sclera of the eye and the cranium to the head. It is therefore very tempting and justifiable to conclude that in maintaining the intravenous pressure nature has two ways—the helping action of the contracting muscles for the great majority of the veins—peripheral and central—and a more or less elastic capsule for the retina, kidney and brain, where the muscles are absent. On antomical grounds Sanderman comes to the same conclusion as regards the eyes. He is struck, moreover, on physiological grounds by the tense similarity with the kidney, as was the writer of this paper on pathological grounds. " In general there exists a marked similarity between the formation of urine by the glomeruli of the kidney and the formation of the aqueous by the ciliary body."

Again the close resemblance between the vascular physiology of the eye and of the kidney is very striking. Already in

embryonic life according to Sanderman the arteries enter the bulb at the weakest part of sclera, namely around the disc, but the veins leave it at the strongest parts of the sclera. The result in embryo and adult will be identical. The fibres of the scleral coat gradually and increasingly compress the veins from within outwards so that the blood is allowed to escape only at a definite pressure. In this way nature not only forms and maintains the intra-ocular pressure, but from it results the continuous increase of the intravenous pressure, so that we cannot gauge the initial pressure in them were they to flow freely without an intra-ocular tension. Sanderman repeatedly found the pressure of the vortex veins to be 50-60 mm. It will be shown later that this figure, if correct, is an enormous one for a vein.

It is obvious that the pressure in the central retinal vein must be higher than the intra-ocular tension, otherwise the outflow of the blood would be impeded. As soon as there is an obstruction somewhere on the disc or from there at any point to the heart, the retinal veins are engorged. The obstruction may be purely local or general, as in heart failure, or respiratory difficulties. In the latter case, the measurement of the brachial venous pressure by Villars' method will invariably show an increase of the venous pressure, but for the retina the basic rule is the same. Whatever the venous pressure it must be higher than the intra-ocular one, at least at the moment of the outflow of the blood through the lamina cribrosa. The difference is very small, it cannot even be measured by Bailliart's dynamometer. May I be allowed to say here apropos of this clever and ingenious, but not easily mastered method of the French master, that the present objections to its use are very similar to those raised against sphygmomanometry years ago, and are bound to follow in the same way, the sooner the better, both for the medical profession and the patients. Therefore for practical purposes we may take the venous retinal pressure as being identical with intra-ocular tension. Again it is obvious that the intracranial pressure must not be higher than the intra-ocular one, otherwise the retinal veins would be engorged, but in my opinion an attempt to measure the former through the venous pressure of the retina would not at present be very reliable as so many modifying factors interfere.

By the special method of passage of the vortex veins through the sclera, the eye is secure against sudden or free outflow of the venous blood and, therefore the venous pressure is constant. If in a normal person the systolic blood pressure in the brachial artery is, say, 120 mm. of mercury and diastolic 80, then in the arterioles it would be approximately two-thirds, *i.e.*, 80/50. In the capillaries the systolic pressure is still further reduced, say,

to 30 mm., but the diastolic does not fall so quickly. From the physiological point of view the central retinal artery is an arteriole. By the ingenious and clinically correct method of Bailliart we can measure both on the living eye. I have not had any experience with the systolic pressure. It is of little importance clinically and the pressure applied on the eyes to produce it is very discomforting, but I often measure the diastolic and quite agree with Bailliart and his followers that in the ophthalmic artery on the disc it is normally approximately 0·45 of the brachial diastolic. What is it in the retinal capillaries? Slightly above the intra-ocular tension, otherwise the capillaries would be permanently closed. What would be the intra-vascular pressure in the venous capillaries? For the same reason slightly above the intra-ocular tension, *i.e.*, identical with that of the capillary. But here we meet with a difficulty. We are certain that the arterial blood enters the eye without any hindrance as a certain pressure has to be applied to reach the level of the mean pressure inside the central artery. This in turn is evidence of the same free circulation in the capillaries, as any obstruction in their bed would immediately be compensated by a rise of the arteriolar pressure. But in the venous circulation we are not on such certain ground. It is feasible that the venous pressure may be below the intra-ocular tension. Then, when sufficient blood has been collected behind the obstruction the raised pressure causes an outflow of the blood and the vein partially collapses or narrows. What probably really happens is that the arterial capillaries open more widely, or in an augmented number constrict more vigorously, and supply more pressure, or transmit more arterial pressure towards the beginning of the venous capillaries, *i.e.*, an increase of the *vis a tergo*. If one applies sufficient pressure on a healthy person's eye to collapse the veins on the disc the following will be seen. The pulsation of the artery becomes more pronounced and is noticeable further back on the retina than previously, but there is no blanching of the disc. The veins on the retina become slightly engorged, especially the primary branches and pulsate more vigorously. If a primary arterial branch crosses a similar venous one on the retina and not far from the disc, the proximal end of the vein may become narrowed and then the dorsal one (away from the crossing) is thicker and slightly enlarged, exactly as happens in the early stage of arterial venous compression, *i.e.*, the artery crushes the vein, under supervision. When the pressure is removed the condition becomes normal.

Moreover, in some patients one can even see faint white shapes appearing on both sides of the spot where an artery crosses veins. In other patients they are absent. In my opinion, this is the result of a special perivascular membrane binding both vessels

together, similar to a tunnel, and the different turgency or tightness of the membrane would explain the appearance of the white stripes in some patients. A similar condition occurs in favourable cases if a vein crosses an artery, but in a less pronounced degree, probably because of the lack of added weight of the superimposed artery. In both varieties, sometimes, the small white stripe may become visible and mildly bank and crush the vein, even if the artery branch cannot be seen. It means therefore that the pressure in the venous capillaries may be (1) primarily superior to the intra-ocular pressure, (2) primarily inferior, but increasing by the *vis a tergo*. Similar considerations would apply to the secondary and primary branches of the central vein. If, however, the *vis a tergo* is unavoidably the primary force the intensification of the venous pulse from the periphery of the retina towards the disc and in the same direction on the disc itself is, in my opinion, proof that here the outflow of venous blood is only possible by a gradual increase of internal vascular pressure, *i.e.*, that the latter is slightly below the intra-ocular tension, but not sufficiently so for the latter to overcome the resistence of the venous wall and of the blood column itself and so to collapse the vein. Therefore, we have to deal with a vicious circle where the slightest outward interference will disturb the delicate vascular balance and immediately cause it to rearrange itself under new conditions and, therefore, all experimental measurements of the intravenous pressure on the animal will suffer from this primordial defect. This is why the clinical significance of both varieties of the venous pulse is nil at the present stage of our knowledge. It is rather a pity as the greater part of retinal haemorrhages are probably due to the diseases of the veins.

Where in the human eye does all the excess of the inflowing blood go, when one collapses the veins, or even the arteries during their diastole? It is accommodated in the capillary bed.

From this lengthy discussion it is evident that the basic structure of the vessels is the same in the eye as in other parts of the body, but modified to a certain degree in order to maintain the venous pressure constantly and more or less independently. We can verify all this theorisation by a simple experiment. Apply the cuff of the sphygmomanometer around the arm of a patient and raise the pressure to say 115 mm. systolic. Soon the arm will become cyanotic, the veins gradually swell and the patient complain of increasing discomfort. Puncture the brachial vein with a large bore needle and leave it inside the vein. The blood will first gush out in a strong stream and then will be seen strong pulsations equal in number to the radial artery beating, but slightly later in order. The pulsation becomes less evident and finally the blood trickles out in frequent drops. The

less pressure applied the less prominent are all these phenomena. It is the back pressure of the capillaries and arterioles that is brought into play by a venous obstruction.

If the reader finds all these details irksome, he should read through a discussion published a few years ago in the *Brit. Med. Jl.*[10] where a paper by a distinguished cardiologist appeared, claiming that the brachial artery always remains open and never collapses during the measurement of the systolic blood pressure, because the colloids of the blood are non-compressible.

In intracranial pressure a similar problem is before us as in the case of the intra-ocular tension. We can only tell that the intracranial pressure is not higher than the intravenous pressure on the disc. In the very interesting book of Villaret,[11] an idea is expressed that there may be two different venous pressures in the intracranial and in the peripheral venous systems. Records of direct measurements on animals are rare in this literature, but those of Binton, Op., are worth mentioning.

Is there any numerical connection between the general venous pressure as measured in the brachial vein and the retinal venous pressure? If, clinically at least, we can measure the arterial brachial pressure correctly, no such method was available until recently for the examination of the venous. Usually a small camera with a glass top was provided, the bottom being left exposed. It was placed on a prominent vein on either the hand, wrist or forearm, made as air-tight as possible, and then air was pumped in under a measured pressure and the veins carefully watched until the vein collapsed. The pressure of air at this point would indicate the intravenous pressure. It is obvious that this method allowed many mistakes to be made and, therefore, the figures of many observers varied greatly. Villaret recently produced a special apparatus whereby the intravenous pressure may be measured by a canula introduced into the cubital or ulnar vein of the patient and therefore carried out automatically under the conditions of a physiological experiment. Under these ideal conditions he came to the conclusion that the maximum value in normal cases is from 10 (female) to 14 (male) cm. of water. As the normal intra-ocular tension is between 18-25 mm. of mercury and the intravenous retinal pressure is almost equal we can see that the retinal is nearly 15-18 times higher than the brachial. This illustrates one of the most striking characteristics of the venous pressure as compared with the arterial. It is impossible to imagine the arterial pressure owing to the tremendous discrepancies normally present in different parts of the body. Has it ever been seen that a patient with 130/90 in the brachial artery would normally show 260/180 in the brain or any other part of

the body? We will refer later on to its pathological importance. For the present I will only point out the fact that in many of my own cases I have measured the venous brachial pressure by Villaret's method in the same time as the retinal one was also measured. If no pathological factor was involved there was no correspondence whatsoever between the two, *i.e.*, the venous pressure may be at its upper limit 14 cm. of water, but the retinal intravenous tension was 15 and vice versa. For instance, in a man of 58 years of age with a blood pressure of 150/85 with advanced sclerosis of the retinal vessels, the diastolic retinal pressure was 40, the intra-ocular tension 25 and the brachial venous pressure 10 cm. water. In a healthy young man of 34 with a blood pressure 120/90, diastolic retinal pressure 25, intra-ocular tension 20, the brachial venous pressure was 8 cm. of water. The autonomy of the eye and of its circulatory system was therefore maintained. It proved, however, to be different in the case of one patient who died from heart-failure. The rise of the brachial venous pressure may be caused by the influence of the central nervous system, or, more often, by a failing heart. There may also be other causes (altogether this much neglected branch of clinical medicine is still in its infancy). There is, however, nothing finer in our clinical armamentarium than the rise of venous brachial pressure as the earliest sign of cardiac failure. It subsides with the improvement of the heart, but if the rise be persistent it is a certain indication of a close dissolution. My patient was a man of 70 years of age with insufficient aortic and mitral valves, blood pressure 170/90, retinal diastolic pressure 40 (by Bailliart's method), *i.e.*, normal for him. The intra-ocular tension was 18 mm. Hg. (Schiötz) intravenous brachial pressure 18 cm. of water by Villaret's method. There were no clinical signs of heart failure but he complained of mild attacks of dyspnoea at night. Eight months later, at his own home, after a few days in bed his blood pressure was 150/20, his liver enlarged and palpable, and his dyspnoea, even in the day-time, was distressing. The lungs were clear, the legs not oedematous. The brachial venous pressure was 20 cm. of water—when he improved for a short time—it fell to 10 cm., rising again to 18 cm. (last examination three weeks before death from heart-failure). During the whole time the intra-ocular tension was 18-20 mm. of mercury.

The possible nature of the spontaneous venous pulse.—Any explanation offered here would have to clarify the fact that (1) only one or two veins may be involved and the rest not at all; (2) digital pressure or massage may transform the ordinary venous pulse into a spontaneous one in some veins, but not in others. All previous detailed investigation of the venous circulation of the eye leads to the conclusion that the cause of the spontaneous

venous pulse must be a local one and not generally affecting all the veins. To this must be added the fact that on the retina, away from the disc, the vein will show the usual widening and narrowing of the trunk, but on the disc only the piston-like movement. The nearer the centre the clearer the piston-like movement of the spontaneous venous pulse will appear. This applies also to veins where external interference will produce the spontaneous pulse. If the vein bends sharply over the substance of the disc, or better still, over the artery just before it disappears from view, it may collapse and blanch, after expelling the blood. The spontaneous pulse is most pronounced if the vein dips into the disc perpendicularly or bends away from the observer at a more acute angle, *i.e.*, an obtuse one towards the observer. *As this is an invariable condition it is the probable cause.* The spontaneous venous pulse will then be explained as an optical phenomenon just at the point where the vein is sharply bent. The curves of the arterial bends if sufficiently pronounced invariably pulsate in all patients. The veins even when they form similar waves (and this is practically limited to congenital tortuosity) only show the usual venous pulse. Then, however, their intravascular tension is very low indeed, as we have to deduct the intra-ocular tension, *i.e.*, it may only be 1 mm. of mercury if the bends are not sharp. In spontaneous vascular pulsation one has to deal with a real bend. Moreover the disc part of the vein is fixed and cannot be widened. The blood therefore has to pass through a sharp bend to squeeze itself from a wide into a narrower trunk and one watches the exact point of this bend. This means that the back pressure becomes more intense and the force of expulsion becomes greater. Hence the transformation of a peaceful rivulet into a miniature cascade.

If this explanation be correct then some deductions are obvious. The veins with ordinary venous pressure will have to bend sharply, but more deeply in the disc. They will then be in the same position as the veins of the spontaneous venous pulse. It is so and if one follows them deep into the disc one can usually see them pulsating with spontaneous pulsation. If one can imagine watching the eye from the inside of the brain one would probably see the spontaneous venous pulse on all the veins, as an obtuse angle seen from the cornea would mean an acute one from the brain. Therefore, two conditions are necessary for the appearance of the spontaneous venous pulse—a sharp bend in the vein not less than 90°; if it is much more than this the vein will collapse before the venous pulse appears. If one were able to bend all the veins to a certain angle they would all show the spontaneous venous pulse. In discussing all these points the position was simplified by allowing a direct route for the sharply bent vein

towards the ophthalmic vein. But in reality some modifying factors interfere. In the substance of the disc the vein may not join the ophthalmic vein, but one of the branches of the central vein at a point where the latter does not yet possess the spontaneous venous pulse, or it may form some additional bends before joining the ophthalmic vein, etc. All this would tend to lessen the intensity of the spontaneous venous pulse and then digital pressure will produce one. The same applies to the central and even the ophthalmic vein where the intensity of the pulsation is diminished to some degree by the increased tortuosity of its course, or by some anatomical peculiarity. For instance, the central vein may be more or less narrowed when piercing the lamina cribrosa. I saw quite a healthy young girl with both veins joined in one trunk, the latter becoming distinctly narrower before going through the lamina. Fry examined 30 eyes microscopically. In only four cases he found a slight narrowing of the calibre of the veins when passing through the lamina. But at the point of exit from the nerve the vein may form acute angles (4-3) and its lumen may be compressed. The artery may also compress the vein when running together in the optic nerve. In my opinion the retinal vessels are under increased pressure on the papilla, covered by a special glial membrane. To all these modifying factors must be added the interference of the respiratory movements of the chest.

I allow myself some freedom in imagining the venous circulation of the brain. The venous blood leaves the eyeball under a pressure of at least 15-20 mm. Hg on a wave-like track. It leaves the brain through the jugular veins where the pressure—in a sitting position—is still a few c.c. of water and in a recumbent position even less and possibly negative during the diastole of the heart and the inspiration of the chest. Moreover, the beats of the jugular venous pulse are exactly double those of the radial pulse corresponding to the diastole and systole of the heart, but sometimes varied by the respiratory movements of the chest. Most probably in the ophthalmic vein we have the same wave-like pulse. If this is so then all the venous circulation of the brain is carried on in a wave-like manner.

Conclusion

1. The spontaneous retinal venous pulse is seen only on the disc and is the intensification of the ordinary venous pulse depending upon the angle of the bend of the vein when entering the disc.

2. It is of no clinical significance whatsoever.

3. The venous retinal pulse vacillates round the intra-ocular tension.

It is my pleasant duty to thank Mr. A. H. Levy for his usual benevolent criticism and help with the manuscript.

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LIGHTRESERVE FOR OCCUPATIONS IN SIGHT-SAVING CLASSES

BY

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(LENINGRAD)

IN young patients with defective sight much depends on physio-therapeutical treatment, and the steadiness of their improvement depends largely on the conditions of the sight-saving classes, and above all—on the *sufficiency of light for occupations.* The same, as I already said, is indicated by my *measurer of lightreserve** through which the study or work are almost as visible as without the measurer. We, in the north, during the dark winter days find it is more difficult than in the south to receive with the measurer a positive result, particularly in feebly-seeing children with strong spectacles, which by themselves absorb a certain amount of light. So it is easy to conceive the various symptoms which can here arise—the *symptoms of overfatigue of the eyes.*

If, in spite of the last degree of fatigue which appears already in the breakdown of the eyes, in their burning, in temporal covering the object of reading, in endless winking of the eyelids, the worker

* The idea of reservelight as conservator of the working eyes was first put forward by me 40 years ago ("Reservelight as measurer of the sufficiency of the light for occupations." *Vracz*, 1897, No. 27), and for the last time—26 years ago ("Die Lichtvorratsprüfung in der Schulphotometrie." *Internat. Arch. f. Schulhygiene*, 1911). Of the works undertaken with my measurer of the lightreserve the investigations of G. J. Schoute merit particular attention which as a result of the School Commission determinated the sufficiency of light in the public-schools of Amsterdam (Geneeskundige Bladen, 1902).

yet continues his occupation, he will try and redress the swollen muscles of the eyes by repeated pressure of the lids and by vigorous movements of the globes from side to side, he will apply his cool hand to his burning eyes, will rub them with the fingers—and he continues to read, and thereupon the eyes again renounce work; once more he is repeating all these manipulations, compelling them to go on working. In this case will already arise not only fatigue of the eyes, but an *overfatigue*, that is such a state which does not disappear after a more or less short rest, but leaves certain traces.

The journalists who use their eyes for work all night, notwithstanding the strain of the eyes and the noise in the head; the clerks, who are seated the whole day at endless rows of figures and letters often under insufficient light; the hypermetropes, who try to dispense with spectacles and work with frowning and winking eyes; the myopés, who bend down over their work until it is done; the feebly-seeing children, who work with insufficient lightreserve, because their spectacles take away a part of light or because the lighting of their place of work is insufficient—all these persons bear in their eyes the traces of overfatigue.

Photophobia is the first symptom of overfatigue of the eyes. Many wear in the street smoke or blue glasses at a time when they really need spectacles for work; instead of removing the cause of the overfatigue of the eyes, the strain of the accommodative muscle, they treat its symptom. *Epiphora* is the second symptom. With removal of overfatigue of the eyes from insufficiency of light or of same by working without spectacles or with faulty spectacles epiphora disappears. The third symptom—*red eyelids*, and sometimes also *chalazia*[1] on the lids. The fourth—*incessant winking of the eyelids*. The fifth—*twitching of the eyelids*. The sixth—*itching, burning and the sense of pressure in the eyelids*. The seventh—*heat in the eyes* and the feeling as if a *foreign body were under the eyelids*. The eighth—*glueing of the eyelids* after sleep. This indicates an inflammatory condition of the lids, but it can disappear without treatment, if the causes of overfatigue of the eyes are removed. The ninth symptom—"*flying spots*," which are also visible to the untired eye, if we look through a small opening at a light surface. In myopia the "spots" are noticed by the unfatigued eye also without such adaptation; but in fatigue they become very obvious and in some cases lead to a fear of organic disease (see the history of the girl S. K.). The tenth symptom—*rapid fatiguing* of all the apparatus, which takes part in the act of vision: of the *retina*, of the *accommodative muscle* and of the *convergent muscles*. The eleventh symptom—extraordinary *irritability* of this apparatus. The twelfth symptom—*headache*.

All these symptoms from working in insufficiency of light can be

eliminated by the measurer of the lightreserve, and that is why I concluded my communication on lightreserve[2] with the following words: "Taking into consideration that the civilized world more and more accepts the importance of saving the health and not least that of the eyes, that the choice of localities for schools is more dependent on the lighting facilities now than before, that more and more it becomes usual to employ the photometer as the light-reservoir and that this sanitary control is also adopted by many works here and there; starting from these points, we can say that the time is not far off, when in the schools and workshops we ought to pay as much attention to the sufficiency of the light as to the temperature of the air and the duration of the work."

The same certainly concerns the sight-saving classes, where the equal displacement[3] is necessary as in normal schools.

That displacement must be produced in two directions: (1) written on the board is deciphered by the scholar without blinking (*a*) from his own place, (*b*) only at displacement to one of the front benches and (*c*) is not deciphered from the front benches at all, and (2) separate words in the book are made out by the scholar also through the smoked glasses of the measurer of light-reserve (*a*) at his table, (*b*) only at displacement nearer to the window and (*c*) are not made out even at the window. In the case of (*c*), where the oculist cannot help, the engineer has to step in. In the most difficult cases one will be obliged to apply to that adaptation which I have presented in my article "Gewalztes Prismenglas und versteckbare Pultlampen zur Verbesserung der Beleuchtung in den Schulen" (*Wochenschrift für Therapie und Hygiene des Auges*, 1914, No. 29).

Here I cite from this article only the three following figures.

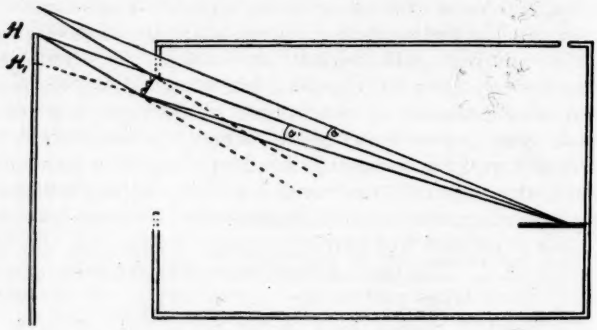

FIG. 1.

Rolling prism glass for reinforcement of the day-light in the depth of the schoolroom.

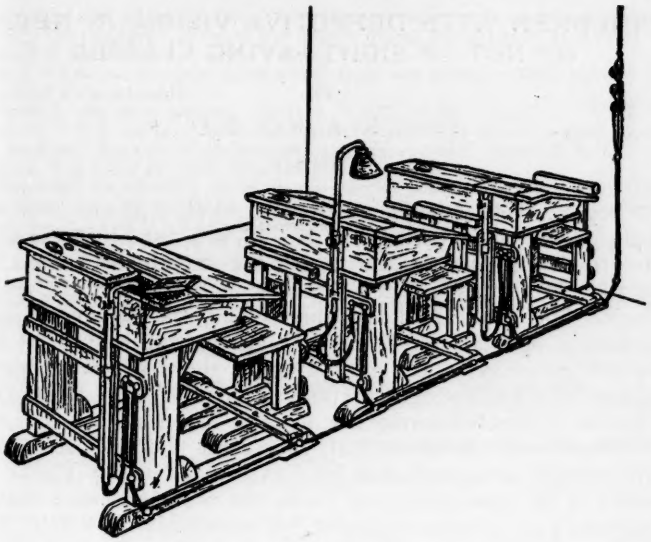

FIG. 2.

Individual school-lighting with concealed heating-lamps.

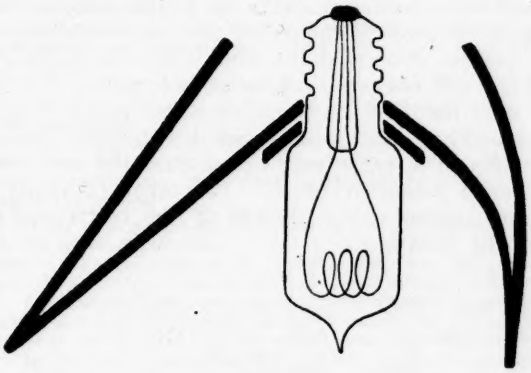

FIG. 3.

The shade of the concealed lamps. Natural size.

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CHILDREN WITH DEFECTIVE VISION, IN NEED OR NOT OF SIGHT-SAVING CLASSES

BY

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THE boy F. (vide *Brit. Jl. of Ophthal.*, Vol. XXI, p. 243) with atrophy of the optic nerves was No. 79 in a list of 170 cases of optic atrophy, treated by me during the extent of 11 years and shown in 1933 at the annual conference of the Leningrad Ophthalmological Institute.[1] As I told the meeting, the physiotherapeutic treatment of optic atrophy from the beginning till the present time consisted generally in the application of the *first triad*, which is produced by the following procedures: (1) by the *thermophore*, a hot-air douche is directed during five minutes into the open eyes; (2) by *cathaphoresis* medicamental substances (iodine, strychnine, nitroglycerine) are conducted by means of electricity during ten minutes to the visual paths and (3) by the *radiophore*, one compels d'Arsonval's currents to act during five minutes in the region of the spinal marrow in connection with the visual tracts.

Among the 170 cases of optic atrophy there were 62 (36·5 per cent.) of syphilitic origin. All the remaining obtained some improvement from the treatment. As to the syphilitic atrophies, the greater proportion of them (34) also received amelioration of sight, five persons conserved the same vision as before the treatment, but 23 (13·5 per cent.) continued to lose their sight.

On the same list there are 15 children and youths from 8 to 20 years of age. Three of these revealed hereditary syphilis and the sight was different in each case: better after the treatment, worse and the same as before treatment. The other 12 young patients, all with ameliorated vision, showed in the better eye improved sight after the treatment.

		A	B			A	B
1	(No. 46)	0·001	0·03	7	(No. 98)	0·05	0·2
2	(No. 128)	0·03	0·05	8	(No. 107)	0·15	0·2
3	(No. 47)	0·002	0·07	9	(No. 146)	0·08	0·3
4	(No. 90)	0·01	0·08	10	(No. 113)	0·02	0·3
5	(No. 75)	0·05	0·1	11	(No. 109)	0·03	0·5
6	(No. 65)	0·06	0·15	12	(No. 79)	0·04	0·7

A = Before treatment. B = After treatment.

1. ***Here is the history of No. 12 who was spared the sight-saving classes.*** B. F., eight years of age, entered March 25, 1929, under No. 110. ***Diagnosis.*** Partial atrophy of the optic nerves in both eyes.

History. At the age of 1 year 8 months was affected by exanthematic typhus. R.W.—The feebleness of vision was noticed during the last year, as the boy began to work in the school.

V.R. = 0·03; L.V. = 0·04. The visual fields are normal. Daily seances of the first triad were indicated.

April 1, the first seance. April 6, V.R.L. = 0·06. April 14, V.R.L. = 0·1. April 20, V.R.L. = 0·12. April 29, the ophthalmoscope shows a good aspect of the papillae, Atrophy is confined to the temporal part. June 10, V.R.L. = 0·15. June 26, V.R.L. = 0·15. July 5, interruption.

November 13, the boy works in the normal school. V.R.L. – 0·2. *Ophth.*, pale discs, tortuous vessels in the right eye. Above treatment every other day. December 2, V R.L. = 0·25. December 21, V.R.L. = 0·3. January 6, 1930, V.R.L. = 0·35. January 14, V.R.L. = 0·45. January 20, V.R.L. – 0·5. February 6, V.R.L. = 0·6. March 13, V.R.L. = 0·6. April 13, V.R.L = 0·7. May 7, the treatment is stopped, May 30, V.R.L. = 0·7. The young patient visits us from time to time after school hours. The eyes are healthy, but the pallor of the temporal part of the discs remains.

2. *Here is the history of another boy who required sight-saving class treatment and received it.*

J. M., aged eight years, entered September 28, 1934, under No. 10161.

Diagnosis. Partial atrophy of the optic nerves in both eyes. Divergent strabismus in the right eye. Nystagmus in both eyes.

History. On the third day after birth nystagmus appeared. The condition is still unchanged. The pupils act regularly.

V.R. = 0·01; V.L. = 0·02. The visual fields are normal. *Ophth.*, atrophy is only in the temporal part of both discs.

Daily seances of the first triad are given.

October 4, V.R. = 0·01; V.L. = 0 02. October 10, V.R. = 0·01; V.L. = 0·03. October 16, V.R. = 0·02; V.L. = 0·03. October 22, nystagmus has almost disappeared. October 28, V.R. = 0·02; V.L. = 0·03. November 15. V.R. = 0·02; V.L. = 0·03. With – 2·5 D. sph., V.R. = 0·03 and V.L. 0·05. December 28, with spectacles, V.R. = 0·03; V.L. = 0·05. The treatment ceases.

Admitted with great difficulty to a sight-saving class, the boy appears May 14, 1935, with a small abatement of the sight, and he receives a second course, which is able to be given simultaneously with the study. Again daily seances of the first triad were given.

May 14, V.R. = 0·02; V.L. = 0·04 with spectacles. May 26, V.R. = 0·02; V.L. = 0·05. May 31, V.R. = 0·03; V.L. = 0·05. June 17, V.R. = 0·05; V.L. = 0·08. The treatment is stopped.

The boy received a third and fourth course, and later, February 19, 1937, as he was apprised of the following case, he proceeded to a fifth course, although his sight at this time was not less than 0·1 and attained to the third class. He was in very good mental condition.

3. *The history of a girl, who was admitted to a sight-saving class, and later sent to the school for the blind.*

S. K., aged 15 years, entered January 10, 1937, under No. 338.

Diagnosis. High myopia, macular changes in both eyes, retinal haemorrhages.

History. Treatment of the eyes began in 1931, the girl at that time had 0·1 without spectacles, but at the time of treatment her sight had become worse and at the end of 1931 she saw only 0·03. In 1934 she was sent to the physiotherapy department where she received iontophoresis with calcium, and in two months her sight rose with correction to 0·2. After this treatment she entered a school with sight-saving classes. In 1936, some deterioration of her sight being apparent she consulted an oculist, who advised her to pass over to the school for the blind. The physician of the sight-saving classes consented to this, affirming that there was no advantage for the girl to be occupied in their school. In the school for the blind her sight hindered her, which was too small in the school for the seeing, and and so the end was that the girl returned again to physiotherapy.

She wears spectacles – 12·0 D. sph. Her myopia is higher than – 20 D. with correction V.R. = 0.04; V.L. = 0 03.

The treatment consisted in iontophoresis of 1 per cent. calcium chloride during two minutes with force of 2 m.a. on each eye.

January 16, V.R.L. = 0·1 with −20 D. January 23, V.R.L. = 0·2 with −22 D. January 31, V.R.L. = 0·3 with −22 D. February 20, V.R. = 0·3 with −22 D.; V.L. = 0·3 with −24 D. March 11, V.R.L. = 0·3 with −23 D, and −24 D. The young patient is now ready to continue the study in the school with the sight-saving classes.

4. *The history of a young man who dispensed with the sight-saving classes.* G. V., 18 years of age, entered November 1, 1934, under No. 11338.

Diagnosis. High myopia, macular haemorrhages in both eyes.

History. Always sees badly at all distances. Has worn spectacles from the age of 13 years, only for reading.

V.R. = 0·02 with −16·0 D. sph. = 0·08; V.L. = 0·01 with −12·0 D. sph. = 0·04.

The treatment—as in the previous case.

November 6, V.R. = 0·15 with −16 D.; V.L. = 0.06 with −12 D. The treatment is stopped.

September 7, 1935, V.R. = 0·2 with −15 D.; V.L. = 0·2 with −18 D. September 11, V.R. = 0·3 with −15 D.; V.L. = 0·3 with −18 D. September 13, to the play in "ensemble" spectacles −13·0 D. sph. for the right eye and −16·0 D. sph. for the left are indicated. September 17, V.R. = 0·3 with −15·0 D.; V.L. = 0·4 with −18 D. September 23, V.R. = 0·4 with −15 D.; V.L. = 0·4 with −18 D. September 29, V.R. = 0·5 with −15 D.; V.L. = 0·5 with −18 D. October 7, V.R. = 0.5 with −15 D.; V.L. = 0·6 with −18 D October 23 V.R. = 0·6 with −15 D.; V.L. = 0·7 with −18 D. November 26, V.R. = 0·7 with −15 D.; V.L. = 0·7 with −18 D. The treatment ceases.

September 3, 1936, V.R. = 0·6 with −14 D.; V.L. = 0·4 with −17 D. October 1, V R. = 0·7 with −14 D.; V.L. = 0·5 with −17 D. The treatment is stopped.

We see that the successful first case is matched by the no less astonishing fourth case; that they both have been spared the sight-saving classes and the less happy cases—second and third—also received some benefit, but it is needful to keep in mind that to help a scholar to avoid sight-saving classes is only possible by improving his sight, not by throwing him from a school for the seeing to a college for the blind.

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ANNOTATIONS

Vaso-dilators in the treatment of tobacco amblyopia

The rationale of the treatment of tobacco amblyopia by vaso-dilators is based on the conception advanced by Maitland Ramsay in 1896 that vascular spasm is a factor in producing transient blindness from tobacco poisoning, a view that Parsons and others have also favoured. Some authorities have pointed out that there are no obvious ophthalmoscopic changes to be seen in the retinal circulation in tobacco amblyopia whilst others suggest that the vascular spasm affects the vessels supplying part of the chiasma. Usher has commented on the fact that visual recovery is more rapid

in those who have indulged in alcohol as well as tobacco than in those who have taken tobacco only.

In 1930 Pflimlin working on this vascular spasm hypothesis treated 11 patients suffering from tobacco amblyopia with injections of sodium nitrite twice weekly for 3-11 weeks, 73·3 per cent. recovered 6/12 vision or better and 46·6 per cent. had 6/6 or better in an average of 36 days.

Cordes and Harrington have reported six cases treated by subcutaneous injection of sodium nitrite on alternate days, 83·3 per cent. recovered 20/30 vision or better in an average of 24 days and 50 per cent. had 20/20 in both eyes in an average of 10 days.

Duggan in 1935 reported 24 cases which he had treated with 6 to 10 intravenous injections of sodium nitrite administered daily, 87·5 per cent. recovered 20/30 or better in one or both eyes in an average of 18 days and 50 per cent. had 20/20 in one or both eyes in an average of 30 days.

In a series of 22 cases treated by acetyl choline injections, 72·7 per cent. showed a visual improvement to 20/30 or better in at least one eye in an average of 14 days and 31·8 per cent. recovered 20/20 in an average of 13 days.

There is some dispute as to the manner in which these vaso-dilators act. Some authorities doubt whether vaso-dilatation of the retinal vessels occurs at all, others think that vaso-constriction takes place and some comment on the very transitory action that these drugs would exert on the vessels of the visual pathway, probably for not more than a few minutes.

However, whether the vascular spasm conception is correct or not and whatever the precise action of these vaso-dilator drugs may be on the vessels of the visual pathway there seems to be substantial clinical evidence to date that their use is of value in effecting a rapid recovery of visual acuity in tobacco amblyopia, for it is a fact that even mild and moderate cases require at least two or three months total abstinence for recovery of vision and in severe cases anything between five and thirty months may be necessary.

Some of the patients who received treatment by vaso-dilators in the series commented on above did not abstain from tobacco during treatment and yet showed visual improvement.

It seems that sodium nitrite is slower in effecting visual recovery than acetyl choline but that the degree of recovery with the former drug is greater than when the latter is used. This is probably due to the fact that sodium nitrite is destroyed, inactivated and excreted less rapidly than acetyl choline and so is able to maintain its vaso-dilator action longer: with acetyl choline the visual improvement is more rapid but it seems that ultimately it is less in degree than with sodium nitrite in the majority of cases reported to date.

Prevention of Industrial Eye Injuries

An exhibition dealing with the prevention of industrial eye injuries was opened at the Royal Eye Hospital by the Earl of Athlone, K.G., on June 22. Mr. Vernon Cargill, Chairman of the Hospital, opened the proceedings with an address in which he welcomed the Earl of Athlone and recalled the great interest which Her Majesty Queen Mary has always taken in the work of the Royal Eye Hospital. He pointed out that the numbers of eye injuries attending the hospital showed a steady increase over the past three years and amounted to 7,700 last year.

The hospital has set up an Industrial Eye Injuries Committee on which serve representatives of the National Safety First Association, the Home Office, Members of Parliament and members of the honorary staff of the Hospital. The result has been that an exhibition of protective devices will find a permanent home in the Out-patient Department.

The Earl of Athlone declared the exhibition open and congratulated the hospital on this pioneer movement. He emphasized the importance of prevention in this work.

Mr. Joseph Minton, who has done an immense amount of the spade work which has resulted in this movement, then gave a short address. He alluded to the new Factory Act which will enlarge the scope of compulsory use of goggles and other protective devices, and dealt with the problem of re-education of the one-eyed workman. At the end a film was shown which Messrs. Kodak had kindly prepared.

The Royal Eye Hospital is to be congratulated on this piece of pioneer work in a sight-saving campaign and it is to be hoped that other eye hospitals, especially in manufacturing centres, will soon follow their admirable lead.

ABSTRACTS

I.—SURGICAL OPERATIONS

(1) **McArevey, J. B. (Dublin).—Corneal transplantation in an aphakic eye.** *Irish Jl. of Med. Sci.*, October, 1937.

(1) **McArevey** here prints a communication made to the Section of Ophthalmology of the British Medical Association, Belfast, July, 1937. He emphasizes the importance of detailed examination of the anterior part of the globe and advises examination by means of

the slit-lamp, by infra-red photography and by double transillumination. Should an opaque lens complicate the state of affairs, the author states that there are three ways of dealing with it. It may either be removed before the grafting, or at the same time as the grafting is performed or at some date later. Elschnig's opinion is that aphakic eyes are unsuitable for corneal grafting.

McArevey's patient was a man, aged 63 years, poorly nourished and of bad physique, but no general abnormal condition was found; the urine was free from albumen and sugar and the Wassermann reaction was negative. The right eye had been blind for more than 20 years, and the left for four years, both as a result of ulceration. The corneae showed dense central leucomata which reached nearly to the limbus. There was accurate perception of light in each eye.

The patient was admitted to hospital and underwent a good deal of preliminary conjunctival treatment with division of a large anterior synechia.

On March 26, 1936, a corneal grafting was performed on the left eye according to Tudor Thomas's technique. In removing the opaque disc from the patient's eye a band of adherent iris was divided. The lens was seen to be opaque. The eye did well at first but later the graft became opaque and vascularized. Three months later the tension rose and the graft burst open with extrusion of the lens, after which the graft healed in good position and the eye has remained quiet with total corneal opacity.

The patient was anxious to undergo further treatment to improve his vision and so the right lens was extracted and a month later a corneal transplantation was performed. It was decided to place the graft eccentrically to avoid the band of anterior synechia which was present. The eye was soft and the operation difficult. When the disc was removed normal vitreous presented. But, in spite of all this, the result was better than could have been anticipated. The graft healed and remained transparent and after a fortnight a good red reflex was obtained. Vision at four months after the operation was finger counting at 2 metres with +6·0 D. sph.

The author is to be congratulated on his perseverance and success.

R. R. J.

(2) **Busacca, A. (S. Paolo).—Introduction of an ivory plate into the anterior chamber in keratoplasty in cases of extensive adherent leucoma. (Einführung einer Elfenbeinschale in der Vorderkammer zur Keratoplastie bei grossem Leucoma adhaerens).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCIX, p. 472, 1937.

(2) **Busacca** describes a case where in order to facilitate the subsequent plastic operation for leucoma adherens he inserted an

ivory plate into the anterior chamber through a limbal incision after he had freed all adherent iris from the back of the cornea. The eye showed marked ciliary injection for about a week and then became quiet in about five weeks. The cornea gradually became more transparent and after five months he was able to perform a corneal graft. The author proposes to remove the ivory scale and the cataractous lens at a later date.

D. R. CAMPBELL.

(3) **Moretti, E. (Catania).—A contribution to the surgery of corneal and trachomatous pannus. (Contributo alla chirurgia del panno corneale tracomatoso).** Communicated to the *Soc. Oftal. Ital.*, Rome, October, 1937.

(3) **Moretti** discusses the various medical and surgical methods of treating pannus and their history. He comments on the dangers and complications of some of these procedures.

The author has devised and practised an operation which he calls perirrhaphy or limbus-rhaphy. This operation consists in the passage of a silk suture through the episcleral tissues 3 mm. from the limbus around the entire circumference of the eye. The suture enters the conjunctival and episcleral tissues at "9 o'clock" in the right eye and "3 o'clock" in the left eye, traverses 7 mm. of episcleral tissue and is then brought through the conjunctiva and inserted again at or near the point of exit. In this manner it is passed round the circumference of the anterior segment of the eye until it emerges at the original point of entry. Six mm. or so of the suture is left long and is secured to the skin at the outer canthus by adhesive strapping. After 24 hours the eye is dressed, copper sulphate is applied to the affected conjunctiva, dionine drops and atropine ointment are instilled, and thereafter hot bathings and ung. hydrarg. oxidi flavi are added thrice daily to the routine treatment. Periodically the suture is moved through the episcleral tissues in order to increase its irritative action. In the majority of cases the suture is left *in situ* for 20 to 30 days.

Moretti has treated 42 cases of trachomatous pannus in this manner and claims "excellent" results in the case of active pannus but only moderate results in cases where the pannus is of long standing and relatively avascular.

He believes that the hyperaemia and phagocytosis induced by this treatment are responsible for the improvement.

H. B. STALLARD.

(4) **Chandler, P. A. (Boston).—Dacryocystorhinostomy.** *Trans. Amer. Ophthal. Soc.*, Vol. XXXIV, p. 241, 1936.

(4) **Chandler** reviews the history of the dacryocystorhinostomy operation and comments on its many technical features. He reports the results and follow-up of 100 dacryocystorhinostomy operations performed by him or under his supervision.

These he divides into three series (1) Mosher's technique, which includes straightening of the upper part of the septum (but this was not done in Chandler's series), removal of the anterior third of the middle turbinate bone, curettage of the anterior ethmoidal air cells and extirpation of the medial wall of the naso-lacrymal duct. After cutting an oval aperture in the medial wall of the lacrymal sac the anterior lip was sutured to the periosteum of the frontal process of the maxilla. Fifty-three operations were performed on 47 patients and 70 per cent. in this series were successful. (2) The anterior lip of the middle turbinate was removed, the medial half of the lacrymal sac was excised and the nasal mucosa slit vertically opposite the open sac the lips of the incision being sutured to the anterior and posterior edges of the lacrymal sac respectively. No. 4 silk on full curved cutting needles held in Mosquito forceps were used. Eighty per cent. of 25 cases were successful. (3) The anterior tip of the middle turbinate was removed and the tear sac was incised in the form of a T, the horizontal incision being 3 mm. from the upper border extending from the anterior to the posterior edge of the lacrymal sac, the vertical cut extending from the centre of the horizontal incision down to the base of the sac. Similar incisions were made in the nasal mucosa and the three flaps thus formed were united by silk sutures, one posteriorly, two superior and one anterior, thus fashioning a tunnel of mucosa running from the sac to the nasal cavity, the top of the sac being held up in its proper position. Twenty-two operations were performed by this technique and all were successful.

H. B. STALLARD.

(5) **Pagani (Vercelli). — Anaesthesia in ophthalmic surgery. (Procedimanti di anestesia in oculistica).** *Rass. Ital. d'Ocul.*, October, 1937.

(5) **Pagani** gives a short account of the various developments in the production of anaesthesia since Koller introduced cocaine into our practice. There are three forms of anaesthesia which may be produced in various conditions, as required. (1) General anaesthesia, (2) by infiltration, (3) local, superficial by instillation.

General anaesthesia is still necessary in certain cases, especially in children, who have not the self control necessary for operation under superficial anaesthesia. For them the older drugs, chloroform and

ether, are often unnecessary; avertin is specially suitable for children; if the anaesthesia is not deep enough, it will be possible to produce deep anaesthesia by inhalation without struggling or distress to a small patient. Avertin has its own dangers however in the elderly, and in renal subjects.

Evipan at first seemed to be ideal, and in short operations is still the best. If a longer duration is needed a second dose may be given. It is inadvisable to give a large dose in the attempt to ensure long duration.

For most ophthalmic operations, superficial anaesthesia by instillation of cocaine, is insufficient; it is advisable to produce anaesthesia by infiltration. Injection of novocaine and adrenalin in 0·25 per cent. solution into the tissues around the sensory nerves of the region will give loss of sensation without hindering the co-operation of the patient. Such methods are specially needed when we have to deal with an eye already inflamed, or where the tension prevents the ready absorption of the drug from the surface. Lastly, when the patient is nervous it is advisable to give some nerve sedative before the operation; the combination of morphine and scopolamine is that frequently used with advantage. The author prefers a compound sold under the name of pre-anest—this is bromopial—scopolamine in a hypertonic solution of bromide of sodium. Its use, Pagani says, does away with the nausea and vomiting, which may follow other drugs. Children do not take these pre-anaesthetics well and for them it is advisable to employ some other method, probably general anaesthesia.

HAROLD GRIMSDALE.

(6) **Imre, J. (Budapest).—Plastic operations of the eyelids.** *Trans. Ophthal. Soc. U.K.*, Vol. LVII, Pt. 2, p. 494, 1937.

(6) **Imre** describes the principles of plastic reconstruction of the lids. He favours the use of adjacent skin wherever possible and covers the defect by a tongue-shaped sliding flap at the extremity of which he excises an elliptical piece of skin to effect sliding and elevation of the flap to the desired extent. The principles of his method are best studied by looking at the illustrations which accompany this paper. He favours the excision of malignant neoplasms from the lids rather than radiotherapy which in a number of cases produces satisfactory superficial healing but allows the growth to extend deeply. Ninety-seven of Professor Imre's cases treated surgically had no recurrence of the neoplasm.

H. B. STALLARD.

II.—MISCELLANEOUS

(1) **Wood, D. J. (the late) (Cape Town).—Night blindness in eye disease—suggestions and speculations. The Doyne Memorial Lecture, Oxford Ophthalmological Congress.** *Trans. Ophthal. Soc. U.K.*, Vol. LVII, Pt. 2, p. 469, 1937.

(1) **Wood** suggests that there is a double metabolic system in the retinal pigment epithelium, one which is concerned with the regeneration of the visual purple for the rods and the corresponding substance (whatever it is) for the cones, in fact the production of photo-chemical substances, and the other serves the general nutrition of the bacillary layer. Experimental work shows that the retina is capable of storing vitamin A, a food factor essential for the maintenance of healthy retinal pigment epithelial cells and their function. There is also experimental evidence to show that vitamin A is used in the regeneration of visual purple. Dark adaptation is complete only where the retina is in contact with its hexagonal epithelium which is its source of vitamin A, quantities of which are lost in the act of seeing. Vitamin A combines with a protein to form visual purple, while under the influence of light visual purple breaks down again into vitamin A and a colourless substance which is lost, a catalyst being present to promote the former change.

The author discusses the pathology of retinitis pigmentosa. He believes that the prime element in the causation of this disease is to be found in the pigment layer.

He comments on the evidence that the cones contain some photo-sensitive substance which accumulates in darkness and bleaches very rapidly on exposure to light. He believes that in retinitis pigmentosa there is a further step in enzyme deficiency, an inborn metabolic defect, and that on account of the more complete failure to synthesize visual purple, and later its analogue in the cones, night blindness occurs and the bacillary layers perish. It is probable then that this disease is due to an inborn defect in the intra-cellular enzyme and that its effect is first noticed in the oldest part of the retina, the intermediate zone. Without contact with the retinal pigment epithelium no visual purple is produced from vitamin A in the rods of the retina.

H. B. STALLARD.

(2) **Hird, R. Beatson (Birmingham).—The pupil.** *The Birmingham Medical Review*, December, 1937.

(2) In his valedictory address on retirement from the post of President of the Midland Medical Society, **Beatson Hird** gives an excellent account of the pupil, as regards the anatomical, optical and neurological sides. The embryology of the sphincter and dilatator muscles is fully described and the nervous connexions are illustrated by a couple of diagrams.

The actions of drugs receive attention and the author gives a clear account of the pupil reactions. He concludes his admirable paper as follows:—

"There is probably no part of the body that, in itself, can be of such diagnostic assistance as the pupil, which indeed we might well name the magic circle. For here we get such valuable help in the diagnosis of various local diseases of the eye, especially glaucoma and iritis. It is in the pupil that we may read of the action of the poisons of opium, belladonna and nicotine, of the toxins of botulism and diphtheria. Here is written large the past infection of syphilis. The pupil reactions will proclaim the genuine epileptic seizure and will decide whether a case of blindness is true or feigned or hysterical. Diseases scattered far and wide in the central nervous system can be run to earth. In the pupil are mirrored the emotions of fear and anger and agony, and it is here that the ever-watchful anaesthetist can read in the widely dilating pupil the danger of impending death."

R. R. J.

(3) **Charamis, J. S. (Athens).—Marfan's syndrome. (Le Syndrome de Marfan).** *Arch. d'Ophtal.*, New Series No. 12, p. 1067, 1937.

(3) **Charamis** presents a case which exhibits the characteristic symptoms first described in 1896 to the Société Medicale des Hopitaux de Paris.

The condition has also been described under the term "Arachnodactyly" and as such is referred to in the ***British Journal of Ophthalmology*** of April, 1936, p. 238.

The name Marfan's Syndrome was given to the association of ocular symptoms and abnormalities with various alterations in the hands and feet.

The author points out that in many cases the ophthalmologist is the first person to be consulted as the ocular symptoms are usually the first to attract the attention of the patient or his friends.

In the article under review Charamis cites a case that he has had under continuous observation for the past five years and is now ten years old.

He notes that there was absence of ordinary crypts in the iris, together with heterochromia iridis, enlarged eyeballs and corneae. There was also subluxation of the undersized lenses, one up and one down. The suspensory ligament was clearly visible and a remnant of pupillary membrane was present. The lenses were cataractous, the opacity consisting of minute dust-like particles and like the other ocular symptoms these are considered to have an endocrine aetiology. There was also some diplopia referable to the lenticular subluxation, and there was also a high degree of myopia.

The general symptoms included: emaciation, debility, elongation of the limbs, enlarged tongue, high palate and dental abnormalities, kyphosis, scoliosis, elongation and attenuation of the digits, tallness of stature, dolicocephaly and highly developed interarticular cartilages.

The reproductive system was poorly developed, the cardio-vascular reflex was reversed: low basal rates, low blood-sugar and calcium.

In this case the conditions were congenital: the patient was the only member of the family affected and there was no syphilitic history.

The pituitary and parathyroid glands were considered to be the endocrine glands affected.

The pathology of the condition is still considered to be too obscure to admit of fixing the terminology.

As regards treatment, apart from operative measures for cataract, no satisfactory remedial methods have as yet been determined.

F. R. HILL.

(4) **Shoji, Yoshiharu (Japan).—Clinical appearances and pathology of black or brown cataract. (Clinique et pathogenie de la cataract noire ou brune).** *Arch. d'Ophtal.*, New Series No. 12, p. 1057, 1937.

(4) **Shoji** contributes notes on 18 cases of black cataract together with his views on them and other reported Japanese cases amounting to 36 in all.

He says that under 30 years of age black cataract is the exception, between 51 and 80 it forms 50 per cent. of the cases considered.

In the majority of the cases seen alterations of the fundus were also noted, *e.g.*, choroiditis, retinitis pigmentosa and optic atrophy.

Some granular deposits have been found but were not obvious without the aid of staining.

The causes of the colouration he discusses under the headings of:—(*a*) blood pigment, (*b*) sclerosis, (*c*) melanin. He dismisses from consideration under (*a*) all those cases which have been complicated with an intra-ocular haemorrhage.

That the appearance is due to the refractive effect on the fibres of the lens caused by sclerosis as was stated by Fuchs he discounts.

The presence of tyrosin as a factor he thinks requires further investigation, and he is inclined to think that the colour may be due to melanin which does not ordinarily form crystals visible to the microscope, though in some unexplained conditions they have been visible as brown-coloured grains of the same hue as the cataract.

He believes the melanin theory to be gaining ground but requires further investigation and the pooling of the results obtained.

F. R. HILL.

(5) **Schieck, F. (Würsburg).—The ophthalmoscopic diagnosis of papilloedema. (Die ophthalmoskopische Diagnose der Stauungspapille).** *Arch. f. Ophthal.*, Vol. CXXXVII, p. 203.

(5) For the early diagnosis of papilloedema with the ophthalmoscope by the direct method **Schieck** relies on the presence of a haze over the central vessels or along the perivascular glia spaces at any point in the physiological cup of the optic disc. This haze, at first faintly but gradually more definitely obscuring these vessels, is due to an exudation under the membrana limitans interna, which is accordingly raised by it; the dilatations of the perivascular spaces, also due to exudate, are frequently observed, although they also occur in the later stages of a neuritis.

The exudate under the limitans interna soon spreads between it and the vessels, and in places also obscures the latter at the margin of the disc.

As the papilloedema subsides the fluid under the limitans also recedes, but remains recognisable for a relatively long time during the process of healing.

In optic neuritis the haze or exudate as above described is absent; the vessels only after a time dip down into the swollen nerve fibre bundles.

In pseudoneuritis too the central vessels lie perfectly clear and unobscured on the nerve fibres; there is no evidence that the limitans interna is raised.

The Gullstrand ophthalmoscope is not, as some writers insist, a suitable instrument for observing these early changes on the papilla.

THOS. SNOWBALL.

(6) **Streiff (Genoa).—Is Fuchs' heterochromia a disease with a special pathogenesis. (L'eterocromia di Fuchs e da considerarsi ancora come forma morbosa con patogenesi propria?).** *Ann. di Ottal.*, April, 1937.

(6) Many authors, in treating of Fuchs' heterochromia iridis, have included in their account cases of definite chronic cyclitis; Fuchs was at pains to separate these from the forms which he described; for this reason, some writers have claimed that the disease is commonly an expression of tubercle. Fuchs in his description showed that the K.P. which often accompanies the heterochromia, has special characters, being very small and scattered over all the posterior surface of the cornea. The precipitates are seldom perfectly round but usually have crenate margins. Synechiae are not present. Not infrequently Horner's syndrome may be observed in these cases, indicating disturbance of the sympathetic nerve. In a recent paper Mecca describes the microscopic findings in the heterochromic iris; he shows that there are signs of long-standing chronic inflammation.

Streiff thinks that this may be due to vascular disturbance following irregular action of the sympathetic.

HAROLD GRIMSDALE.

(7) **Stallard, H. B. (London).—Cavernous haemangioma of the orbit successfully removed by Krönlein's operation.** *Lancet*, January 15, 1938.

(7) **Stallard** reports the case of a man, aged 36 years, whose vision had been failing for nine months. On examination the right eye was displaced upwards and forwards; pupil reactions were normal, ocular movements were normal, papilloedema was apparent in the upper half of the disc, the oedema extending into the adjacent retina, and vision was reduced to finger counting at a metre. The right field was full and an enlargement of the blind spot present. The man was found to be otherwise in good health. The fellow eye was normal in all respects.

It was considered that the condition was neoplastic rather than inflammatory and was situated within the muscle cone, but outside the nerve sheaths.

The orbit was explored by the Krönlein operation and a neoplasm, the size and colour of a ripe damson, was found below and embracing the nasal side of the optic nerve. It was freed by delicate dissection with the tip of the finger, and removed. The patient made a very good recovery, and about five months after operation vision was 6/9, and the pupil reactions and movements of the globe were improving.

The pathological report was a cavernous angioma.

The paper is illustrated by five pictures, showing the incision adopted, the field of operation showing the saw cuts in the outer wall of the orbit, a radiogram taken a week after operation, macroscopic and microscopic appearances of the tumour.

R. R. J.

(8) **Langdon-Brown, Sir Walter (London).—Hormones and vitamins in ophthalmology.** *Trans. Ophthal. Soc. U.K.*, Vol. LVII, Pt. 2, p. 454, 1937.

(8) **Sir Walter Langdon-Brown** discussed the importance of vitamin A in maintaining the nutrition of epithelium and of affording it an increase of resistance to infective agents. It seems that once the epithelial cell barrier is penetrated by micro-organisms vitamin A has no further influence in combating the infection. Needham found that a pregnant sow fed on a diet in which vitamin A was absent produced young in which the eye cup and lens had failed to form.

Deficiency of vitamin B may cause muco-purulent exudates in the lids, anterior interstitial keratitis, proliferation of lens epithelium (observed in experimental animals but not clinically), retrobulbar

neuritis leading to optic atrophy and combined degeneration of the cord.

Lack of vitamin D during pregnancy had led to zonular cataract, dental hypoplasia and tetany. It is probable that hypocalcaemia is the essential factor in this type of cataract formation.

The author also discussed the part played by the thyrotropic hormone of the pituitary in the production of exophthalmos. Tumours of the pineal gland affect the eyes only by mechanical pressure effects which may lead to bilateral ptosis, modified Argyll Robertson pupils, inability to look up, loss of pupil reflexes and visual field defects.

In describing the ocular complications of diabetes he commented on the fact that temporary ophthalmoplegia, due to neuritis was more frequent before insulin therapy; that diabetics were liable to arteriosclerosis; and that serious retinal complications may result from an ill balanced diet in which the carbohydrates are very low and the fats increased thereby interfering with the effectiveness of the insulin.

H. B. STALLARD.

(9) **Maxwell, Euphan (Dublin).—Case of ectopia lentis associated with arachnodactyly.** *Irish. Jl. of Med. Sci.*, October, 1937.

(9) A case reported by **Miss Maxwell** was that of a boy, admitted to an orphanage in 1934, at the age of 10½ years. No family history was available and the boy was found to have a weak heart and defective vision. His mental condition was subnormal. Two years later he developed a mild toxaemia and the left eye (always the more defective) became blind and painful. On admission to the eye hospital the condition was one of panophthalmitis and Miss Maxwell removed the eye. Subsequent examination revealed a typical example of arachnodactyly. The right eye showed a lens, with peripheral opacities, dislocated up and out, with a wide gap in the suspensory ligament below. The iris was tremulous and the anterior chamber deep. The pupil was 2·5 mm. in diameter and reacted badly to mydriasis. Tension was 20 mm. Hg and the fundus was normal. Vision with +9·0 D.sph. +1·0 D. cyl. 45° was 6/12 part. With +4·0 D. sph. added he read J. 2. Without glasses he could read J. 16 held close to his eyes. The field was full.

The appearances seen with the aid of the slit-lamp are described and figured; there are good illustrations of the boy, his hands and feet, with radiographs of each and an electro-cardiograph, and a short bibliography is appended.

The case was communicated to the section of ophthalmology at the annual meeting of the British Medical Association at Belfast, July, 1937.

R. R. J.

BOOK NOTICES

Strabismus. Its Re-education: The Physiology and Pathology of Binocular Vision. By A. CANTONNET and J. FILLIOZAT, with the collaboration of G. FOMBEURRE. Translated by the late Max Coque. Second Edition. London: Wiseman & Co. 1938. 21/-.

The second edition of this book is, with a few minor alterations, prudent omissions, and one brief but necessary addition, a reprint of the first, reviewed in the Journal for March, 1936.

The paragraphs on "The Characters of Strabismic Amblyopia" have been revised to good effect (p. 177); Polliot's apparatus and exercises are no longer recommended; and the sections, pp. 205-207 and 296-297 of the first edition, on "Strabismus with False Macula," and "Divergent Strabismus with False Convergence," have rightly been jettisoned in favour of a briefer and more cautious statement under the heading "Strabismus with Paradoxical Exteriorisation of Images" (p. 292).

The insertion of five pages (180-185) based on Travers' study of abnormal retinal correspondence attempts to incorporate the results of some recent reseach.

Ophthalmic Nursing. By D. E. GRAND, formerly Sister of the Ophthalmic Department, St. Thomas's Hospital, London. Pp. 106. Illustrated. Edinburgh: E. & S. Livingstone. 1938. Price, 4/-.

The author of this little book has been an ophthalmic ward sister and she has endeavoured to set out the principles of ophthalmic nursing in a form that is easily understood and readily accessible for nurses.

The book is divided into 3 sections. Section 1 describes very briefly the salient features in the anatomy of the eye, common refractive errors and ophthalmic nursing. Section 2 is devoted to ophthalmic conditions and therapeutic preparations. The arrangement of the ophthalmic conditions in alphabetical order may be of some service to a nurse who knowing the diagnosis of the case in her charge is referring to the book for information, but it is an unfortunate arrangement to introduce into a handbook. The sequence and continuity of description is interrupted and it is obvious that the author has experienced some difficulty in the allotment of various diseases to their appropriate alphabetical letters, for instance the section begins with a paragraph on "accessory sinuses of the nose," placed under the letter A.

Section 3 is devoted to a brief description of the main object of certain ophthalmic operations and contains lists and illustrations of the standard instruments required for these.

The printing, illustrations and reproduction of the book are good. It is a useful handbook for nurses and should serve well the purpose for which it is written.

Eleventh Annual Report of the Memorial Ophthalmic Laboratory, Cairo. Cairo: Schindlers Press. 1936. Price, 25 piastres.

The Memorial Ophthalmic Laboratory carries out all bacteriological and pathological investigations for all the government ophthalmic hospitals in Egypt, under the direction of Dr. Wilson. Here and at the adjoining ophthalmic hospital post-graduate courses of instruction are held twice a year. Patients are received by recommendation from oculists throughout the country for such prolonged clinical observation as it is impossible to carry out in a crowded out-patient department.

The wealth of pathological material may be judged by the number of limbal tumours examined during the year, 48, of which rather more than half were malignant.

The enormous thickening of the eyelid, which is often met with in trachomatous countries is due to the formation of dense fibrous tissue in the subepithelial layer of the conjunctiva and not to the result of inflammatory changes occurring in the tarsus itself, according to Wilson. This is an important pathological distinction, although to the operator the thickening appears to be of the tarsus itself.

The seasonal epidemics of conjunctivitis in Egypt were first studied by Lakah and Khouri in 1902 (Annales d'Oculistique), by Meyerhof in 1911 (Archives d'Ophtalmologie) and by MacCallan in the Reports of the Ophthalmic Section of the Department of Public Health from 1914 to 1923. The maximum incidence of Koch-Weeks conjunctivitis in Cairo is in May, when the mean maximum temperature has risen considerably; thereafter there is less. Gonococcal conjunctivitis is at its greatest height in October, three months after the heat has begun to lessen, about which time there is also a recrudescence of Koch-Weeks infection.

Wilson believes that there are two fly-breeding seasons in Cairo, one in March and April, which is immediately followed by the first Koch-Weeks epidemic; as the temperature goes on rising the flies die off and the epidemic decreases in virulence. The other fly-breeding season is in October when the epidemic of gonococcal conjunctivitis breaks out. As the temperature thereafter falls, the flies die off, and the epidemic stops. There is a second slight increase in Koch-Weeks conjunctivitis in September. He states that there are variations in the dates of epidemics according to the latitude and temperature.

Wilson correlates these fly breeding seasons with the epidemics caused by the two different organisms. The method of carrying out the fly census was by counting the flies weekly which became stuck on pieces of fly-paper fixed in a selected place in the open air, where the patients await examination at the neighbouring hospital. This interesting research must have entailed considerable labour.

The above facts are so striking and so significant that Wilson unhesitatingly concludes that heat and flies are the two most vital factors in the causation of epidemic conjunctivitis in Egypt. Other factors cannot be neglected such as direct contagion by hand, clothing, washing utensils, etc., but these he believes are entirely subsidiary.

Another research was carried out among very young children at a village near Cairo, in order to determine the age of infection with trachoma, and to detect in conjunctival scrapings the presence of Halberstaedter-Prowaczek Körperchen (H.P.K.). The conjunctiva of children living under ordinary village conditions very early become infected with pathogenic organisms. This usually occurs in the first three months of life, but quite a number are infected towards the end of the first month, and therefore cannot be classed as ophthalmia neonatorum. All children are infected with either Koch-Weeks or gonococcal conjunctivitis before trachoma stage I makes its appearance. There is an appreciable interval between the first appearance of H.P.K. and the first clinical sign of trachoma; the latter may be entirely obscured by papillary hypertrophy.

H.P.K. are found in 100 per cent. of these very early cases of trachoma, and may even be present before the disease is clinically distinguishable. It is necessary to make several microscopical films, taken from different parts of the conjunctiva, and search very carefully before asserting that H.P.K. are not present.

With regard to the stages of the inclusions found in these cases the initial body was the form most frequently encountered. These were visible as intra-epithelial cocco-bacillary bodies of varied size and shape, often clumped together in little groups and staining blue with Giemsa. Free initial bodies were not found with certainty. Mature forms of H.P.K. were commonly demonstrable. Free elementary bodies, however, were not a prominent feature of the cases.

This Eleventh Annual Report by Wilson maintains the high standard of its predecessors, and like them is essential for all laboratories where investigation of ocular material is carried out.

Twenty-Fourth Annual Report of the Ophthalmic Hospitals Section, 1936. Ministry of Public Health, Egypt. Cairo: Government Press. Price, 10 piastres.

This Report shows the continued progress of the ophthalmic amelioration of Egypt by the establishment of new hospitals and clinics. There are now 59 ophthalmic hospitals or ophthalmic departments attached to general hospitals, as well as 14 travelling hospitals. More than a million new patients are treated annually.

At the ophthalmic clinics carried on at schools it was found that

99 per cent. of the pupils were trachomatous, though in many of these the disease had reached the stage of cure. Trachoma stage IV, either naturally or as the result of treatment.

Post-graduate courses in ophthalmology are held twice a year.

The important and interesting statistics of the clinical work of the hospitals are maintained as in previous years.

Ophthalmic Hospital of the Grand Priory in the British Realm of the Venerable Order of the Hospital of St. John of Jerusalem. Report for 1937. London: Chancery of the Order, St. John's Gate, E.C.1

The Annual Report on the clinical work at this hospital by Lieut-Colonel Sir John Strathearn is of great interest, in view of the civil disturbance in Palestine throughout the year. Acts of terrorism and sabotage were of daily occurrence and the publication of the eagerly awaited report of the Royal Commission did nothing to relieve the tension; indeed it is no exaggeration to say that it led to a worsening of the situation. As a consequence the military and police forces imposed many restrictions on travel on roads ever open to ambush, and this might have been expected to cause a diminution in attendances. However, there was a decided increase due to the much greater number of local inhabitants of Jerusalem and its suburbs, who took advantage of the absence of the usual crowd of peasants coming from a distance.

There were more than twenty thousand new patients seen, of whom more than 7 per cent. required an operation for trichiasis-entropion, the result of trachomatous cicatrization.

The incidence of trachoma among the new cases was 85·82 per cent., 12·7 per cent. of the patients were blind in one or both eyes, most commonly the result of some form of conjunctivitis.

The cycle of drought which plagued Palestine for a decade has happily past; following a winter of ample rains a corresponding reduction in the incidence of acute conjunctivitis was anticipated; but unfortunately owing to the prevalence of measles and to the neglect that accompanies impoverishment, the epidemic was severe.

Bulletin of the Ophthalmological Society of Egypt. Vol. XXX, 1937.

A symposium on the subject of glaucoma at the Annual Meeting of the Ophthalmological Society of Egypt led to the reading of fifteen papers; in addition there were many discussions. The volume has 272 well-printed pages, with numerous illustrations. It may be obtained from the Hon. Secretary, 3, Midan Soliman Pasha, Cairo.

Structural Variations of the Human Iris and Their Heredity, with Special Reference to the Frontal Boundary Layer. By VIGGO ESKELUND, M.D. Pp. 242, plates, 28. Published by Nyt Nordisk Forlag. Arnold Busck, Copenhagen. H. K. Lewis & Co., Ltd., 136, Gower Street.

This careful and painstaking investigation is published in English with a summary in four languages. It comes from the University of Copenhagen and was produced under the P. Carl Petersen Foundation. Its author, Dr. Eskelund, has endeavoured by a detailed examination of photographs of the living iris in 154 persons to arrive at a method of classification of iris pattern in man and to work out the inheritance of the various types, principally with a view to their value as evidence of paternity. He considers that certain characters can be recognised in each eye (*i.e.*, number of contraction furrows, amount of atrophy of the anterior layer, position of the lesser circle and amount and distribution of mesodermal pigment) and a formula constructed which will give at a glance the type of iris.

The explanation is slightly complicated by a terminology not in common use here, such as " iris ripple " (lesser circle), " frontal boundary layer " (anterior layer) and " scratches " (small crypts). The description of the " frontal boundary layer " as of varying degrees of opacity through which the deeper vascular layer can be seen is also misleading as are the diagrams in this section as they seem to imply that the anterior layer of the iris is not vascular. The use of a higher magnification before photographing the eye might have helped to clarify the description.

One cannot help feeling that a detailed examination of a much larger number of cases, including many different races, is needed before any statements can be made on the subject of the heredity of iris pattern. We are dealing here with a variable similar to that of finger prints. No two individuals will show an identically similar pattern, yet a broad classification into types is possible. Whether such characters are of much value from a genetic point of view is still doubtful. This collection of detailed observations and photographs is, however, of value as forming the beginning of a more accurate classification of iris pattern than the older ones depending on colour and macroscopic appearance.

Die Funktionsprufung des Auges. By Professor Dr. OLOFF and Dr. PODESTA. Second Edition. Pp. iv-190. Berlin: Julius Springer. 1937. Price, R.M. 7.50.

Oloff and Podesta " Examination of the functional capacity of the eye " is the second edition of a book by Stargardt and Oloff which appeared in 1912 and dealt with the examination of the

colour sense only. In the present edition considerably more than half of the text is still devoted to colour vision, the rest being distributed over central vision, accommodation, refractive errors, perimetry, light sense and the extra-ocular muscles. There are also chapters on malingering and on the visual requirements in the public services of Germany. Of necessity there is a distinct discrepancy in the treatment of colour vision on the one hand and the remaining visual functions on the other hand. The section devoted to colour vision and its anomalies is indeed a satisfactory summary of the practical measures in common use. The theoretical aspect is not neglected and it is rather surprising that the anomalies of colour vision are spoken of in the terminology of red-green blindness and such-like terms. This is all the more strange as throughout the text the more modern outlook is given. The book is devoid of illustrations and has been written with an eye to the requirements of medical officers in public services. With that object in view the additional material contained in this edition may prove helpful, but this, as the authors seem to recognise, will not replace the necessity for practical work in an ophthalmological clinic.

Die Kuppelungen von Pupillenstörungen mit Aufhebung der Sehnenreflexe. By Professor F. KEHRER, Münster i.W. Pp. 60, 2 illustrations. Leipzig: Georg Thieme. 1937. Price, R.M. 4.60.

In Vol. 16 of this Journal (p. 449) Adie contributed an article on "a disorder characterised by tonic pupils and absent tendon reflexes," a condition which, though previously described by writers in this country and elsewhere, is apparently known on the Continent as "Adie's Syndrome" or "Adie's Disease."

In the course of a critical survey as to how far this syndrome can be regarded as a definite disease the author of this monograph, in which constant reference is made to the work of Adie and Behr, discusses the border-line cases of pupillotonia in its relation to other types of pupil anomaly, and enquires into the conditions and comparative frequency with which these other types occur in association with similar disturbances of the reflexes.

The features of the tonic pupil according to Adie and its variations are discussed in relation to the incomplete form of the fixed pupil and to variations in the true reflex inactive pupil (Argyll Robertson), and the extreme variability of the individual, or the sum-total of the features belonging to each type is emphasised.

The claim that pupillotonia *per se* represents aetiologically and clinically a type *sui generis*, it is held, cannot be maintained; it is impossible to draw a sharp distinction between it and the reflex

inactive or fixed pupil and other chronic forms such as the katatonic pupil, or hippus, etc.

Abolition of the tendon reflexes in the absence of any sign of other neurological abnormality is observed not only in conjunction with pupillotonia but also with other pupil anomalies—reflex inactive pupil (either in cases of tabes dorsalis with few symptoms or in the form of pseudotabes in its stricter sense) and the more or less complete form of absolute rigidity. The name " pupillotonic pseudotabes " is suggested for the so-called Adie's syndrome; though no sign of lues is demonstrable in this condition, it is possible in view of the occurrence of true sero-negative tabes that this syndrome may at least in some cases be a special form of this variety of tabes.

Isolated tendon areflexia, which Adie included among the incomplete forms of this disorder, represents the solitary residual sign of various diseases of the central nervous sysem, of hereditary or exogenous origin.

In discussing the pathogenesis and aetiology of Adie's syndrome he concludes that it is one of a series of symptom-complexes that point to a lesion of a small circumscribed area in the sympathetic-parasympathetic nervous system (in the pituitary-hypothalamic region), and are produced by a variety of causes. It is one of several syndromes that in their turn readily pass into others—it is not a disease.

Vitamine und Hormone in ihren. Beziehungen zur Augenheilkunde. Von Professor Dr. KURT WACHHOLDER, Professor Dr. WERNER KYRIELEIS, Dozent Dr. REINHARD BRAUN. Heft 25 of Beihefte zur Zeitschrift für Augenheilkunde—Basle, 1938.

The supplements to the Zeitschrift für Augenheilkunde vary from records of original work to reviews of literature and to post-graduate lectures. The present volume on vitamines and hormones in ophthalmology consists of three post-graduate lectures, one dealing with the general problem of vitamines and hormones and the two others with their application to eye diseases. These lectures are essentially an elementary summary of the literature on the subject containing much that is readily available in standard publications and little that is new. Though there is a discussion on palsies in hyperthyroidism, there is no reference to exophthalmic ophthalmoplegia. The rarer syndromes are briefly touched upon and the descriptions are not sufficiently convincing to be really helpful. The lack of references in a volume of this type diminishes its value considerably.

OBITUARY

H. V. WÜRDEMANN, M.D.

An obituary notice of Dr. Harry Vanderbilt Würdemann, from the pen of Edward Jackson, appeared in the *American Journal of Ophthalmology* for June, 1938, and we should not omit to refer to Dr. Jackson's memoir in this brief abstract.

Würdemann was born in 1865 and died on January 30, 1938. He took his M.D. in 1880, but before taking up medicine he had spent four years in an architect's office and as a topographer with the U.S. Geological Survey. After post-graduate study in London and on the Continent he started practice in Milwaukee. He was Professor of Ophthalmology in the Chicago Eye, Ear, Nose and Throat College and was for a time Editor of the *Annals of Ophthalmology*. In 1909 he moved to Seattle. Würdemann is best known in this country for his admirable transilluminator. He brought out a book on "Injuries of the Eye" in 1912 and this ran to a greatly enlarged second edition in 1932, which became a recognised text-book on its subject. It was very largely a record of his own cases.

Würdemann was a keen sportsman and was interested in aviation. He was a Colonel in the Medical Reserve Corps of the United States Army.

A. B. CLUCKIE

We regret to record the death of Alexander Beck Cluckie of Bath on June 30, 1938. Born in 1886 he was the son of N. Beck Cluckie, the Glasgow ophthalmic surgeon. Cluckie took the M.B., Ch.B.(Glas.) in 1908 and was house surgeon for three years at the Moorfields Eye Hospital before settling in Greenock where he was assistant ophthalmic surgeon to the Greenock Eye Infirmary. He took the D.O.(Oxon.) in 1912; served in the Great War where he was wounded while rescuing an officer, for which he received the Croix-de-Guerre, and was later ophthalmic surgeon to the 3rd and 4th Armies. After the War he settled in Bath and was appointed ophthalmic surgeon to the Bath Eye Infirmary and Bath Educational Authority. He was well known in the West of England, not only professionally but as an exponent of Rugby football, in which he represented Bath and the county of Somerset.

CORRESPONDENCE

CORNEO-SCLERAL SUTURE IN CATARACT EXTRACTION

To the Editors of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

SIRS,—I have read with interest Mr. Affleck Greeves' letter in the correspondence section of the July number criticising the corneo-scleral suture in cataract extraction. (See *Brit. Jl. of Ophthal.*, May, 1938.)

I agree with his preference for a conjunctival stitch on the grounds that a more liberal conjunctival flap is obtainable by this method of suturing than with the corneo-scleral stitch. The tensile quality of the conjunctiva and its friability is so variable in elderly persons that the effect of a purely conjunctival suture in controlling the cataract section wound in the manner desired is, I believe, considerably less constant than in the case of a suture traversing such tissues as the cornea and sclera, the tensibility of which is relatively very small compared with the conjunctiva.

I intend to try a series of cases using a slight modification of Mr. A. Greeves' stitch by passing the upper traverse of the stitch not only through conjunctival and subconjunctival tissue, as he recommends, but also through the superficial layers of the sclera.

I feel that by this means the suture would be less likely to be affected by stretching or sliding of the bulbar conjunctiva above the section wound.

I am interested to read Mr. A. Greeves' statement that hyphaema "is a complication with which I have fortunately not been troubled."

I am, yours truly,

H. B. STALLARD.

35, HARLEY STREET, W.1
July 14, 1938.

NOTES

Royal Society of Medicine: Section of Ophthalmology

THE following officers have been nominated for the session *1938-39*:—*President, Malcolm* Hepburn; Immediate Past President, W. H. McMullen; Vice-Presidents, A. D. Griffith, M. L. Hine, D. Leighton-Davies, P. G. Doyne, Percival Hay, T. Snowball; Hon. Secs., E. F. King, C. D. Shapland. Members of Council: *Physicians, E. A.* Blake Pritchard, S. H. Browning, R. A. Hickling. Metropolitan members: A. C. Hudson, A. Rugg-Gunn, B. W. Rycroft, Wing-Commander Livingston, T. K. S. Lyle, A. F. MacCallan, Hon. G. J. O. Bridgeman, J. H. Doggart, Jean Dollar. Provincial

members: T. Harrison Butler, W. E. Heath, J. Foster, W. M. Muirhead, T. Colley, R. Beatson Hird. Bowman Librarian: Arnold Sorsby. Representative on Editorial Committee: E. Wolff.

* * * *

Appointments

The Royal London Ophthalmic Hospital:—Mr. R. Affleck Greeves has been appointed Consulting Surgeon and Messrs. J. H. Doggart and Harold Lloyd Ridley, Assistant Surgeons.

The Oxford Eye Hospital:—Mr. C. G. Russ Wood has been appointed Consulting Surgeon, and Mr. A. C. L. Houlton, Assistant Surgeon.

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Royal Westminster Ophthalmic Hospital

THE 121st Annual Report of the Royal Westminster Ophthalmic Hospital contains the usual statistics of work and financial details of the year 1937. An interesting article on the history of spectacles by Eugene Wolff is included. This is illustrated with four cuts, the last of which reproduces Cruickshank's "Swearing at Highgate," which includes the figure of a man wearing "temple spectacles."

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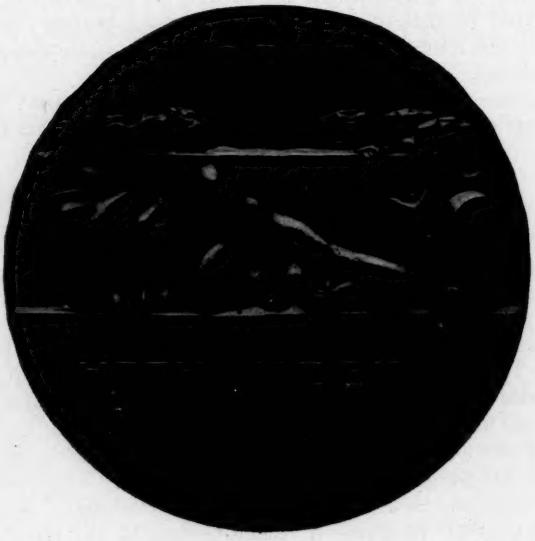
Société Française d'Ophtalmologie



WE have much pleasure in publishing an illustration of the medal presented by the Society to its Membres d'honneur.

Antepontio Conjunctivae Fornicis

WITH respect to the paper with this title by Dr. N. Shimkin, of Haifa (p. 287), Professor Liebermann of Budapest informs us that he published in *Klin. Monatsbl. f. Augenheilk.*, 1922 (Vol. LXVIII), an account of the operation he devised for severe cases of spring catarrh. Professor Liebermann says "I only did not use the words antepositio conjunctivae fornicis, but the method is exactly the same." We regret that in publishing Dr. Shimkin's paper no notice was taken of Professor Liebermann's priority in this field.

FUTURE ARRANGEMENTS

1938

October 7—Midland Ophthalmological Society, at Birmingham and Midland Eye Hospital (Annual Meeting).

CONTEMPORARY OPHTHALMIC LITERATURE

Archives of Ophthalmology. *May, 1938.*

VERHOEFF. Anomalous projection and other visual phenomena associated with strabismus.

BIRGE. Cancer of the eyelids. 1. Basal cell and mixed basal cell and squamous cell epithelioma.

COWAN, A., and COWAN, T. Superficial punctate keratitis: its treatment with iodine solutions.

LAVAL. Avertin anaesthesia for ophthalmic operations.

BROWN. Net average yearly changes in refraction of atropinized eyes from birth to beyond middle life.

OBRIG. Moulded contact lenses.

WEINTRAUB. Strength of epinephrine compounds in ophthalmotherapy: a new epinephrine ointment.

June, 1938.

DAVIS. Personal experiences with intracapsular cataract extractions.

FELDMAN. Practice of dark adaptation: a review.

BLAESS. Removal of cataract by aspiration.

CHANCE. Sir Hans Sloane's account of an efficacious medicine for soreness of the eyes: an episode in 18th century ophthalmology.

SWAB. Encephalitic optic neuritis and atrophy due to mumps: report of a case.

SMUKLER. Simplification of the O'Connor Cinch operation.

GURDJIAN. Packing of internal carotid-cavernous arteriovenous aneurysm.

GIVNOR and GANNON. Magnesium content of capsulated lenses: a review of its probable import: preliminary report.

GUIBOR. A classification of concomitant strabismus: results secured in various types.

HAWLEY and PEARSON. Vitamin C and its relation to cataract.

HUBBARD. Caustic burns of the eye.

American Journal of Ophthalmology. *June, 1938.*

PERERA. Epithelium in the anterior chamber of the eye after operation and injury.

LAMB. Exudative retinitis.

O'BRIEN and ALLEN. Staphylococcus conjunctivitis.

SANDERS. Metastatic carcinoma of the iris.

JULIANELLE, SORY, SMITH and LANGE. The effect of tartar emetic on the course of trachoma.
MACDONALD. Aetiology of idiopathic retinal detachment.
WEEKS and MORRIS. Induced hyperpyrexia in ophthalmology.

Archives d'Ophtalmologie. *June, 1938.*

COPPEZ and DUJARDIN. A case of Besnier-Boeck's disease or Schaumann's benign lymphogranuloma with ocular manifestations.
THUREL. Carbolisation of the spheno-palatine ganglion in ophthalmology.
POLEFF. New methods in contemporary experimental trachomatology.

Zeitschrift für Augenheilkunde. *May, 1938.*

BÖCK. The clinical and anatomical aspects of the angioid streaks in the fundus.
STEINSEIFER. The use of electro-cautery for ulcus serpens and herpes corneae.
SÜLLMANN and WEEKERS. Contribution to the origin of delactose cataract.

June, 1938.

KREIBIG. Rare orbital tumours.
URBANEK and ALBRECHT. Vitamin C and age.

Archivio di Ottalmologia. *March-April, 1938.*

BORSOTTI and LOCATELLI. Nervous conduction in experimental leucocytosis from corneal stimuli.
TITA. A case of unilateral palpebral oriental tumours. Inoculation of Leishman's tissue into the eyes of dogs.

Bollettino d'Oculistica. *April, 1938.*

BENCINI. Diffuse congenital choroidal atrophy familial and hereditary.
FOCOSI. Persistant malformations of the oblique fissure of the face.
ORZALESI and CASSUTO. The action of Sympatol on the pressure in the central retinal artery.

Revista Oto-Neuro-Oftalmologica. *March-April, 1938.*

CLIVIO. A case operated on for arachnoiditis with optic atrophy.
CHIATELLINO and PRISTER. Experimental research on the pathogenesis of papilloedema.
BIETTI. Research on the actions of some drugs on the pressure of the central retinal artery with particular regard to adrenalin.
CLIVIO. A case of Jacksonian epilepsy, operation and cure.
TRONCONI. Clinical considerations on a case on unilateral sensory and motor ophthalmoplegia.
DE LISI. Metastatic epidural abscess.
MEDEA. About so-called pseudo tumoural encephalitis.
BOSCHI. The cure of diacephalorachidia with neuritis and optic atrophy.

Archivos de Oftalmologia de Buenos Aires. *March, 1938.*

GIQUEAUX. Hereditary atrophy of the papillo-macular bundle.
MALBRAN and ADROGUE. Uniocular diplopia.
PAVIA. Intense inflammatory bilateral ectropion.

Anales de la Sociedad Mexicana de Oftalmologia y Oto-Rino-Laringologia. *Oct.-Nov.-Dec., 1937.*

VIRAMONTES. Retinal detachment and industrial accidents.
VEKGARA. The ocular fundus in venereal disease.
CICERO. Syphilitic chancre of the eye.